





James Hunter.  
*Haydon.*

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1847

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THE  
PRESENT  
SANATORY CONDITION  
OF  
BIRKENHEAD.

BY  
J. HUNTER ROBERTSON, M.D.

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DEDICATED, BY PERMISSION,  
TO THE RIGHT HON. VISCOUNT MORPETH, M.P.,  
CHIEF COMMISSIONER OF WOODS AND FORESTS, ETC.

BIRKENHEAD:  
PRINTED AND PUBLISHED BY LAW & PINKNEY,  
WATERLOO BUILDINGS.  
MDCCCXLVII.



TO  
THE RIGHT HON. VISCOUNT MORPETH, M.P.,  
CHIEF COMMISSIONER OF WOODS AND FORESTS, &c. &c.,  
THIS TREATISE,  
ON THE  
PRESENT SANATORY CONDITION OF BIRKENHEAD,  
IS, BY PERMISSION,  
VERY RESPECTFULLY DEDICATED,  
BY  
HIS LORDSHIP'S MOST OBEDIENT HUMBLE SERVANT,  
THE AUTHOR.

*Birkenhead, March, 1847.*



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## PREFACE.

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Where much has been already so ably written, and thoroughly promulgated in every conceivable form, by such talented individuals as Mr. Chadwick, Dr. Duncan, &c. on the subject of Public Health, and its inseparable connexion with National advancement and prosperity, any further consideration might almost be deemed a work of supererogation, an unnecessary labour. But as in all places, and at all times, peculiar evils and grievances must be present, which can ever best be met and considered by those acquainted with the localities and their requirements, and having for some time past devoted much of my time to the subject, I have been induced to arrange a few facts and remarks on the question, as relating more particularly to the township of Birkenhead, with a fervent hope that they

may still further assist to stimulate public attention, and arouse public sympathy. I conceive it also to be the duty of every medical man (however seemingly paradoxical) to prevent disease, if possible, as well as to cure it, and persuaded that as a body having much in our power, much may be reasonably expected from us, and, that we can unquestionably render material service to the bringing forward, and properly directing the present all-engrossing and vitally important movement of Sanatory Reform, and, if anything I have pointed out in the following pages, may conduce in the least degree to this great end, my object will be fully and satisfactorily answered, and I shall be enabled and gratified to say “Nec ego frustra.”

*Hamilton-square, Birkenhead,*

MARCH, 1847.

The annexed Tables show the deaths from various diseases in Birkenhead and Tranmere, for the year 1846.

# MORTALITY OF BIRKENHEAD,

FOR 1846.

DISEASE.	Under 1 year	Under 2 years	Under 3 years	Under 4 years	Under 5 years	From 5 to 10	From 10 to 15	From 15 to 20	From 20 to 25	From 25 to 30	From 30 to 35	From 35 to 40	From 40 to 50	From 50 to 60	From 60 to 70	70 to 80, upwards	Number of deaths under each head
Small Pox .....	3	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	5
Measles .....	5	10	1	1	2	..	..	..	..	..	..	..	..	..	..	..	19
Scarlatina .....	..	..	3	..	..	2	..	..	..	..	..	..	..	..	..	..	5
Whooping Cough .....	17	5	1	..	..	..	..	..	..	..	..	..	..	..	..	..	23
Croup .....	5	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	9
Pneumonia .....	15	2	..	..	1	..	..	..	1	..	..	1	1	..	1	..	22
Bronchitis .....	10	3	..	..	..	..	..	..	..	..	..	1	2	1	4	5	26
Phthisis .....	1	3	1	6	1	2	5	5	7	5	5	6	5	..	..	..	52
Fever .....	4	3	2	5	3	1	6	11	4	4	3	6	3	1	..	..	56
Hydrocephalus ....	16	5	..	3	2	1	..	1	1	..	..	..	..	..	..	..	29
Convulsions .....	43	18	1	..	..	..	..	..	..	..	..	..	1	..	..	..	63
Dysentery .....	72	38	4	2	2	1	2	4	3	2	5	4	2	6	2	1	150
Childbirth .....	..	..	..	..	..	..	..	..	..	..	3	3	1	..	..	..	7
Accidents .....	2	..	3	2	1	1	1	3	3	3	5	5	4	6	..	2	44
Apoplexy.....	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	2
Epilepsy .....	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	2
Spasm .....	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1
Cancer.....	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1
Intus Susceptio ....	..	..	1	..	..	..	..	1	1	..	..	..	..	..	..	..	3
Diseased Ovary....	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1
Dropsy and Liver ) Complaint.... }	1	4	..	1	..	..	..	1	1	1	4	1	1	..	1	3	19
Old Age .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	9	10
Disease of Heart ...	1	..	..	..	..	..	..	1	..	..	..	4	3	1	..	..	10
Scrofula .....	..	1	..	..	..	2	1	..	..	..	..	..	..	..	..	..	4
Delirium Tremens ..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1
Disease of Womb...	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	2
Paralysis .....	..	..	..	..	..	..	..	..	1	..	..	1	3	1	..	..	6
Meningitis .....	..	..	..	..	1	..	..	..	..	..	1	..	1	..	..	..	3
Aneurism .....	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1
Operations. ....	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	2
Diseased Bone.....	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	2
Syphilis.....	1	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	3
Erysipelas .....	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	2
Tuberc Mesenterica	3	5	..	..	..	..	1	..	..	..	..	..	..	..	..	..	9
Chorea .....	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1
Disease of Kidney..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
Shortly after Birth.	18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	18
Number of Deaths at different ages	217	101	19	20	13	10	22	27	23	17	30	36	30	19	9	21	614

# MORTALITY OF TRANMERE,

FOR 1846.

DISEASE.	Under 1 year	Under 2 years	Under 3 years	Under 4 years	Under 5 years	From 5 to 10	From 10 to 15	From 15 to 20	From 20 to 25	From 25 to 30	From 30 to 35	From 35 to 40	From 40 to 50	From 50 to 60	From 60 to 70	70 to 80, upwds.	Number of deaths under each head
Small Pox .....	3	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	4
Measles .....	4	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	6
Scarlatina .....	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	3
Whooping Cough ....	4	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	7
Croup .....	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Pneumonia .....	4	2	..	1	..	..	..	1	..	..	..	..	..	..	..	..	8
Bronchitis .....	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2
Phthisis .....	..	..	1	1	..	..	..	..	3	4	3	4	4	3	..	..	23
Fever .....	..	1	1	..	..	..	1	1	1	..	..	..	1	1	1	..	8
Hydrocephalus ....	4	1	1	..	..	..	..	..	..	1	..	..	..	..	..	..	7
Convulsions .....	19	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	21
Dysentery .....	11	5	2	..	1	1	..	2	..	..	1	..	..	1	3	5	32
Accidents .....	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	2
Epilepsy .....	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	4
Dropsy .....	..	..	..	..	1	..	..	..	..	1	..	..	1	1	..	..	5
Old Age .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	1
Disease of Heart ..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	1
Paralysis .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Cancer of Uterus ..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1
Hydrothorax .....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Meningitis .....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Enteritis .....	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1
Scurvy .....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Abscess of Brain ..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1
Tubes Mesenterica ..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Disease of Spine ...	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1
Hepatitis .....	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
Jaundice .....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Debility .....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Number of Deaths at different ages	62	13	9	5	2	2	2	4	7	6	4	4	9	8	5	10	152



#### ERRATA.

- Page 9, line 12, for "their," read this.  
„ 47, first line of table, for "Manchester," read Birmingham.  
„ 50, line 6, for "excited," read exciting.  
„ 58, „ 6, omit "although."  
„ 63, in Abstract, for "Yards," read Streets.  
„ 74, „ 3, for "cooly," read coolly.  
„ 83, line 11, for "engendering," read endangering.





THE PRESENT  
SANATORY CONDITION  
OF BIRKENHEAD.

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No subject affecting our social economy has, for many years, so completely absorbed the public mind, or, has been more prominently urged upon popular attention by Parliamentary reports, evidences, lectures, and essays, or the importance of which has been more universally admitted, than the proposed statutory amelioration of our domestic dwellings and habits, or, as the measures are collectively termed "Sanatory Reforms."

The pre-eminent necessity of some such interference has long been known to, and insisted on by, all those who have devoted any degree of attention to the subject, and is further sufficiently

attested by the hearty co-operation of local authorities generally, and the vivid satisfaction manifested by that portion of the community, for whom it seems more especially designed, viz.—the poor and labouring classes, who while subject to its immediate operations, may be expected most largely to participate in the beneficial results.

From extensive enquiries amongst these, I know that they are disposed to view the movement favourably, and to esteem it, for its intrinsic merits and probable advantages. I conceive also that, with various other adventitious circumstances conjoined, Birkenhead is at this moment peculiarly fitted for the reception and adoption of any remedial or superior adaptation of projects suggested by skill, judgment, or experience. We have an adult population, the very presence of the great bulk of which argues the possession of health, strength, and energy, with the natural characteristics of Englishmen, patient, laborious, and enterprising; in domestic relations, just, grateful, and affectionate. In these we have ready materials to mould and fashion towards a high

destiny, by providing for all, the means of pursuing life with knowledge, principles, and purposes, calculated to dignify humanity, and advance the progress of our portion of the country towards that proud prerogative of "teaching others how to live."

Farther, living in a mature period of the world's history, we may be considered fortunate in possessing a consequent superior experience than its youth; and by imitating the conduct of our ancestors in innovations on custom, for the sake of the true and useful only, we best compliment the noblest portion of former times and their wisdom; and yet how many of the inconveniences to which we are still subjected arise from an obstinate retention of old practices, and a neglect of the advantages which a well arranged system of co-operation would bestow!

From this seeming disregard to comfort, a belief, or libellous persuasion, has arisen amongst the inconsiderate of the upper classes, that the operatives of this country actually love dirt, and that the continued habitation of so many wretched

dwelling by the poor is, in part at least, attributable to their taste and preference!

It certainly is true that habits often reconcile people to inconveniences, and even degradations, from which a little care and resolution might emancipate them; but, speaking from actual and frequent intercourse, I can safely aver, that some other more cogent reasons are invariably present, and nothing similar could be hailed with more gladsome feelings than the possibility of any improvement. That there exists in Birkenhead any indifference respecting, or disposition to overlook, questions and arrangements of such great and pressing interest, affecting the lives and happiness of thousands, we, fortunately, possess too many contrary evidences to assert, for in no one instance of modern times has so much been accomplished for the health, comfort, and enjoyment of a people, or such demands made upon their affection and gratitude, as by those energetic individuals with whose names the rise and progress of Birkenhead are so closely connected.

But it sometimes occurs in communities, as with

individuals, that inclinations towards effecting the public good are inefficiently seconded by the power to achieve, and obstacles and annoyances are perversely or wantonly interposed, defeating present intentions, and discouraging the future. Entertaining such a presumption now, rather than that they are deemed comparatively unimportant, and accordingly laid aside for others of greater actual interest, I feel that I may, as a disinterested observer, while any such evils exist, endeavour to obtain some portion of public attention to the subject, thinking the period highly auspicious for any remarks calculated, in however imperfect and humble a degree, to diffuse such notions of the practically useful, as may assist in multiplying those blessings of earth which are best attained through the agency of social reforms, and the prevalence of domestic happiness.

No power is so likely to assist the poor man as the moral aid of the popular eye, no advocate so able to remove his grievances, establish his claims, or secure his rights; and yet of this power, how

few of the number are capable or inclined to avail themselves, shrinking from any presentment of wrongs, under the persuasion that their voices are feeble, or that their statements, wanting the weight of personal influence, would be disregarded? any interference soon raising a formidable outcry in defence of established custom, and continuance thus giving to wrong a superficial appearance of being right.

Appealing, therefore, to the public on behalf of those who have little leisure or opportunity to speak for themselves, mediating between them and their superiors in rank and influence,—I feel less hesitation in stating any facts bearing upon the subject, or making known any matters falling under my own cognizance, trusting that if wrong in my surmises, or fallacious in my deductions, I may meet with indulgence, and at all events stand acquitted of any interested intention to misrepresent, or any other personal desire, than that of witnessing expanding knowledge applied to the abrogation of abuses, and the furtherance of more general feelings of brotherhood and benevolence.



In tracing the effects of legislation on the sanatory condition of the country, as evidenced throughout the mass of statistical returns, the power for good or ill, wielded by rulers and authorities in general, assumes a fearful responsibility, the formation of laws, the reformation of existing evils, the adapting of legislation to the progress of society, the general interests of thousands, their temporal good here, and even prospects of felicity hereafter, impose a cumulative duty upon men, magistrates, and the influential of all classes, to enquire how all their social mischief has been produced and aggravated, which generates destitution, and makes men suffer when they might live peaceably and happily, inferring also an obligation to apply themselves to an investigation of these causes, their possible alleviation and removal.

That the destinies of this favoured spot, where the means of subsistence and enjoyment exist in profusion, will ever be committed to the direction of apathetic or uninformed minds, we have no right or reason to expect; for the inhabitants of Birkenhead have hitherto shown a corresponding

energy and self-elevation, rising with their requirements, and their past selection argues most favourably for the future—the progress of man is onward, and with an extended, liberal, and soundly instructed constituency, he will be a bold man who has the temerity to suggest any return to exploded prejudices, or the rescinding of just provisions—we have thus every probable assurance that wholesome and vigorous measures now introduced, will become permanent, and acquire the full sanctity of long prescription. It behoves therefore all, each in his sphere, individually to assist in the promulgation of frank and equal relations between man and man; and great will be my own self-gratulation if in the least degree accessory to the advancement of that good which has been the object for ages of the philosopher and the philanthropist.

However plausible a theory, well-grounded its premises, or lucid and powerful the arguments in its support, still, unless the statements of its advocate are corroborated by some reference to past experience, or ascertainment of certain facts, bearing upon and correlative to his views, they will



invariably be met with doubtful suspicion, and there will prevail upon the minds of his readers a defective absence of that conclusiveness which ought invariably to accompany positive assertions, and more especially upon any subject of importance, approaching to that now under our cognizance; and here becomes apparent the great value and significance of statistical knowledge in general, which, instead of contentment with vague and unsatisfactory suppositions, enables us to grasp our subject with confidential assurance, and to arrive at results clearly and distinctly, if not with literal correctness, still sufficiently just as approximations.

It has been established by laborious researches, and extended observations throughout the kingdom, that every human being, born with a sound constitution, is calculated to live a certain number of years, and also, that at any given period of life, the probability of prolonged existence to a certain epoch, is just as surely to be predicated, dependent of course, in both cases, upon the continuance of those favourable circumstances amidst which he is

presumed to be present. The following tables illustrative of this, may, I think, not be uninteresting, I therefore give them:—

#### MEAN DURATION OF LIFE.\*

Whole of England.....	41 years
Surrey .....	45 „
London .....	37 „
Liverpool .....	26 „

#### AVERAGE AGE AT DEATH.

Whole of England.....	29 years
London .....	29 „
Surrey .....	34 „
Manchester .....	20 „
Liverpool .....	17 „

But it so happens, that we are ever surrounded by conditions, more or less adverse to extended being, and, while existence is proverbially uncertain, that also ignorance, incautiousness, and accidents are simultaneously militating against health

\* I refer the reader to the Fifth Annual Report of the Registrar-General of Births, Deaths, and Marriages, p. 38, for an explanation of the meaning of "Mean age at Death," in contra-distinction to Average Age at Death.

and duration of life. These, however, vary according to climate, civilization, and other human arrangements, but are still in many cases silently decimating their victims, and causing diseases and death around us, which are easily preventible, or might be partially controlled; in proof of which it will be seen from the subjoined tables that mortality is greatest, and the period of death earliest, in towns as compared with country districts; and again, varying in certain towns themselves; results clearly deducible from causes dependent for their continuance upon increased intelligence, and the efficiency of sanatory regulations.

TABLES SHOWING THE RELATIVE MORTALITY  
OF A TOWN AND COUNTRY DISTRICT.

TABLE I.

	Area in squaremiles	Estimated Population Jan 1, 1839.	Deaths re- gistered in two years.	Inhabitants to 1 square mile.	Annual Mortality.
Country District	17,254	3,559,323	129,628	206	1 in 54-91
Town District	747	3,769,002	197,474	5,045	38-16
England & Wales	57,805	„	„	265	46-00

TABLE II.

	Total Deaths 1839-40.	Deaths at 70 and upwards.	Deaths at 70 to every 1000 deaths
Country .....	52,204	10,538	202
Towns.....	71,544	6,457	90
England and Wales	„	„	141

On approaching this preliminary part of my subject, as more immediately affecting Birkenhead, in juxta-position with other places, I was considerably struck by the startling appearance presented by the tables of its population and mortality for the year 1846, as contrasted with the previous census in 1841. The following table shows the relative mortality of seven of the principal towns calculated on the average of three years, ending 1841, to which I have calculated and added the average mortality of Birkenhead for that year, also for 1845 and 1846, together with Tranmere and Liverpool for the latter year.

MORTALITY OF SEVEN PRINCIPAL TOWNS,  
*on an average of three years, ending 1841,*  
*Compared with that of Birkenhead, Tranmere, and*  
*Liverpool, for 1845—46.*

Towns.	Population 1841.	Deaths.
Metropolis .....	1,870,727	1 in 37-38
Birmingham .....	138,817	1 in 36-79
Leeds .....	168,677	1 in 36-73
Sheffield .....	85,293	1 in 32-92
Bristol .....	64,298	1 in 32-38
Manchester (Union).....	192,408	1 in 29-64
Liverpool (Parish) .....	223,054	1 in 28-75
Birkenhead .....	8,227	1 in 45 „
	<b>1845</b>	
Liverpool .....	251,000	1 in 34
Birkenhead .....	14,900	1 in 36-35
	<b>1846</b>	
Birkenhead .....	17,562	1 in 28-37
Tranmere .....	5,954	1 in 39-11
Liverpool .....	260,000	1 in 26-25

From the above table it will be observed that the average mortality in Birkenhead for 1841 was 1 in 45, being about the medium between town and country districts, but the fact of the average rising so enormously from that date to 1846 is certainly

very alarming. The table shows the average mortality in Liverpool for 1845 to be 1 in 34. In Birkenhead for same year 1 in 36-35. In 1846 Liverpool was 1 in 26-25. In Birkenhead 1 in 28-35, bearing exactly the same proportion to each other for the last two years. All preconceptions of my own, and, I believe, general impression also tending to contrary expectations, I was for a time almost induced to doubt the accuracy of my calculations, but having at considerable trouble, and with scrupulous exactness, previously compiled the data from authentic and valid documents, confirmed by personal observation and enquiry, and subsequent revision having verified their correctness, I am reluctantly compelled to state, that the mortality in Birkenhead during the past year, has not only far exceeded the usual ratio, but has been equal to, if not greater than, that of any other town in England, with the sole exception of Liverpool, which is well known to be the most unhealthy town in England, the difference being in favour of Birkenhead by a mere trifle. I beg to refer the reader to the following tables, the first of which, although bearing

little upon our present subject, may however be perused with interest, as indicative of its former slow, compared with its late rapid progress:—

### THE POPULATION OF BIRKENHEAD.

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In the year 1801 was 110 inhabitants.

In the year 1821 was 200 inhabitants.

In the year 1831 the population of the township of Birkenhead *including* the township of Bidston was 3,434.

The very trifling increase in the population from the latter year to 1838 causes me to omit the intermediate years—

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### PROPORTION OF BIRTHS AND DEATHS IN BIRKENHEAD IN 1838, 1839, 1840.

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Population in 1838 ..... 5,057

Births „ ..... 218

Deaths „ ..... 113

Population in 1839 ..... 6,467

Births „ ..... 247

Deaths „ ..... 140

Population in 1840 ..... 7,345

Births „ ..... 278

Deaths „ ..... 137



PROPORTION OF BIRTHS AND DEATHS IN  
BIRKENHEAD IN 1841.

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POPULATION.

Males.....	3,798	
Females.....	4,429	Total, 8,227

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English and Welsh	6,660	
Scotch .....	432	
Irish .....	1,091	
Foreigners.....	44	Total, 8,227

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BIRTHS.	DEATHS.
1st quarter..... 77	1st quarter..... 38
2nd do..... 78	2nd do..... 43
3rd do..... 69	3rd do ..... 41
4th do..... 83	4th do..... 60
307	182

Average Mortality, 1 in 45.

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PROPORTION OF DEATHS IN LIVERPOOL IN  
1841.

POPULATION.	DEATHS.
223,054	7,556

---

Average Mortality, 1 in 28-75.



PROPORTION OF DEATHS IN BIRKENHEAD IN  
1845.

POPULATION.	DEATHS.
14,900	404

Average Mortality, 1 in 36-35.

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PROPORTION OF DEATHS IN LIVERPOOL IN  
1845.

POPULATION.	DEATHS.
251,000	7,373

Average Mortality, 1 in 34.

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PROPORTION OF BIRTHS AND DEATHS IN  
BIRKENHEAD IN 1846.

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Population ..... 18,210

Deducting 648 as the actual Inhabitants of 112  
houses in Claughton and part of Oxtan, included  
in late census, the Births and deaths of these dis-  
tricts being Registered at Upton, and not included  
in amount of mortality here given ..... 17,562

BIRTHS.			DEATHS.		
1st quarter	.....	194	1st quarter	.....	84
2nd do.	.....	215	2nd do.	.....	103
3rd do.	.....	205	3rd do.	.....	241
4th do.	.....	195	4th do.	.....	186
<hr/>			<hr/>		
809			614		

Average Mortality 1 in  $28\frac{1}{2}$ .

D

PROPORTIONS OF BIRTHS AND DEATHS IN  
TRANMERE IN 1846.

Population .....	5,954.

PROPORTION OF DEATHS IN LIVERPOOL IN  
1846.

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Population, 260,000	Deaths, 9,703.
Average Mortality, 1 in 26-25.	

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The preceding tables show that in the general mortality, there is a slight difference, as before stated, in favour of Birkenhead, as compared with Liverpool; but I will point out in subsequent observations and tables, that infantile mortality, and that most dreaded of all diseases, FEVER, exceeds that of Liverpool, according to the latest returns made of that town; and from documents in my possession, it appears evident that the average

mortality of Birkenhead has been gradually on the increase for some years past. The present mortality of Tranmere is considerably below that of Birkenhead as shown by the tables.

The mere announcement of this fact must, I am certain, cause to the public generally much surprise, if not concern, and the first impulse of all will naturally be to enquire, whence does this state of things arise, and what measures can be adopted to meet the evil?

Long and justly vaunted for its salubrious situation, the purity of its air, enjoying the bracing effects of sea breezes, possessing advantages surpassed by few places of residence, Birkenhead must not even yet yield any portion of its reputation to the occurrence of what I believe and hope may almost be termed an accidental circumstance, arising from imperfect arrangements or immature provisions, inseparable from its infancy and rapid growth; let us not despond, but rather take a more comprehensive and anticipatory view of its present requirements and future wants; and, although there is no disputing irrefragable facts, let

us attempt to wipe out the stigma, by incessant and vigorous efforts to remove existing evils, and accomplish those systematic, well digested reforms which may be, to all classes, most extensively and permanently useful.

I now proceed to the consideration of some matters in detail.

## AIR AND VENTILATION.

In the laws of Heaven there is no partiality, they prevail over rich and poor alike, and if we would work our way amongst the numerous physical and moral entanglements of this life, our only security is in availing ourselves of superior advantages offered by education, and an acquaintance with those great rules of nature which obtain in and around us, in every particle of matter and every action of mind; and, all expectancy to answer the design of our existence, must be based on properly understanding and observing those first great principles, according to which all thoughts, feelings and actions, shape themselves,

and, without which, we should be incapable of discharging the social duties of life, or enjoying its felicities.

It is strange, and almost incomprehensible, that with the value of such knowledge daily reiterated in every possible phase, nay, frequently forced upon us by the recurrence of some lamentable catastrophe, involving the destruction of valuable life, still that such sad warnings pass unheeded; and the amount of apathy and ignorance existing on this vital subject, remains apparently undiminished, almost unobserved.

It is an unquestionable fact that the greater number of bodily diseases might be prevented by timely precaution, and the application of proper expedients, and also that, too frequently, fatal results are induced and propagated by inattention to certain natural laws of the human organization, and neglect of those principles which most persons from want of knowledge are constantly violating, to the great injury of health and constitutional derangement.

The study of human physiology, in so far as the

avoidance of these evils is involved, should be a branch of education everywhere, and with all; the neglect of this study is almost culpable in those who have the charge of public teaching and youthful instruction, for how very few are to be met with who know themselves physically, or are at all aware of the reciprocal action of mind and body?

It is needless to expatiate further on this topic, suffice it that facts and apposite cases abound, all corroborative of the want of universal information on this subject, pervading not the lower ranks alone, but all classes of society, and the ignorance truly becomes deplorable when its effects assail those whose sole wealth is ability to labour and strength to perform their daily toil.

How much suffering, for instance, exists in factories, large work-rooms, many of the splendid shops of our large towns, and even in the apartment of the cottager, from the want of wholesome management, a due attention to ventilation and other accommodation. It has been estimated by medical men from certain credible data, that those classes which work together in considerable number, such



as tailors, sempstresses, milliners and others, sustain a loss of one-third of adult existence, simply from the want of proper regulations in the buildings in which they are employed; a startling and sufficient proof that, of all the causes which are productive of diseases in towns, by far the most influential is the vitiated state of the atmosphere. Now, as upon this subject some erroneous conceptions are very generally entertained, and as a tacit acquiescence might possibly be accepted by those who have paid but little attention to the enquiry, as confirmatory of their views, I will briefly state for the information of non-professional readers, a few simple facts, relative to that exceedingly interesting and important portion of the human structure, viz. the lungs, and their functions.

Providence has so constituted and ordered a certain class of his creatures, that, in the frame of warm blooded animals generally, a considerable part of the bulk is occupied with an apparatus (so to speak), viz. the lungs, intended solely for the purpose of ventilating, or exposing the blood to the constant action of pure air, they are composed

of an infinite number of air tubes and vesicles, of various sizes, forming an elaborate net-work, estimated by anatomists to offer in man a surface collectively, of twenty times that of the whole human body; their essential importance is further manifested by the fact, that no animal is exempted from them in some modification or other, and by the great care exhibited in contrivances for their due order and safety.

Without stopping to indulge in any analysis of the formation of the blood itself, it will be sufficient for my purpose to state, that for the maintenance of perfect health, it is absolutely necessary that the whole mass of blood, amounting in an adult to about twenty-five pounds, should be incessantly and perfectly subjected to this vivifying process, which is beautifully effected by that other important viscus, the heart, pumping or propelling it, with wonderful regularity and precision, into the lungs, at the rate of 150 or 160 ounces every minute, or, nearly twenty-four hogs-heads every twenty-four hours. But for this exposure of the venous blood to a renewed quan-



tity of pure and fresh air, it has been ascertained from many ingenious experiments, that this, in its impurity, acting as a poison to the body, must inevitably cause the death of animals from asphyxia, as familiarly happens when air is prevented access to the lungs by hanging or drowning; we find, furthermore, that it is not the blood alone which undergoes an alteration in its qualities; the air also, which has just imparted vital purity, is, in consequence, rendered unfit for a second office, and is expired, deteriorated in quality, and unfit for the purposes of life; this will perhaps be better understood by a notice of the constituent chemical properties of air.

On entering the lungs by inspiration, atmospheric air consists chiefly of a gas called oxygen, modified by four times its bulk of another gas called nitrogen, this compound is capable of supporting combustion, and also animal respiration, provided the proportion of oxygen does not fall below a certain amount; but, in the process of respiration, the oxygen is considerably absorbed, and, in its place, we find another gas called

carbonic acid, which is evolved by the union of a portion of oxygen with the carbon; this latter forming a large ingredient in the composition of the blood, and of the body in general. This gas is surely fatal to life, and, if an animal be compelled to inhale it, insensibility and death result in a very few minutes.

The natural breathing of a healthy person is from fifteen to twenty times in a minute, and to allow for the ill effects of the evolution of this gas, it is requisite that he be surrounded by a sufficient bulk of pure air, to avoid a necessitous return of the foul portion, which has been discharged from the system, as dangerous to retain. In prisons each individual is allotted, on an average, a quantity equal to about 1000 cubic feet; it will accordingly be evident, that any inhalation of this contaminated air must, in a degree, corresponding to the quantity, be productive of seriously injurious effects upon health. As confirmatory of this, I subjoin the following table, taken from Dr. Guy's report before the Health of Towns' Commission, which clearly points out, that

when a number of individuals are congregated together, the amount of sickness is in proportion to the space allotted them, provided the ventilation is equally defective in all.

TABLE SHOWING THE INJURIOUS EFFECTS OF  
IMPURE AIR.

	Spitting of Blood.	Catarrh.	Other Dis- cases.	Total.	Per Centage Proportion.		
					Spitting of Blood.	Catarrh.	Other Diseases.
104 men having less than 500 cubic feet of air to breathe...	13	13	18	44	12.50	12.5	17.31
115 men having from 500 to 600 cubic feet of air to breathe...	5	4	23	32	4.35	3.48	20.00
101 men having more than 600 cubic feet of air to breathe...	4	2	18	24	3.96	1.98	17.82
							23.76

It is a common, but most erroneous opinion, that the air of towns is principally deteriorated by grosser and more palpable contaminations, arising from coal smoke; but it is of the first consequence to know that this, although doubtless in itself a great evil, is altogether subordinate, as a cause of disease, when contrasted with those subtle invisible effluvia which proceed from decomposing animal and vegetable substances, and which, in their constant and unceasing agency, are the true ravagers and depopulators of our most crowded and wealthy districts.

Now, the effects of inhaling this poisonous effluvia may not be immediately perceptible, though headache, nausea, depression of spirits, &c., are generally concomitants, yet, the slow but sure and fatal work is going on, and the poor ignorant victims are reduced to a state in which they may be said rather to *perish* than to die.

Cases illustrative of this point are so many and well known that selection really becomes difficult, and I should think that almost every medical

man must have in his experience hosts of instances where disease is chargeable to the want of sufficient supply of pure air, and that alone. The most striking case I can instance is that of the Black Hole, at Calcutta.

In the year 1756, when Calcutta was surrendered to the natives, 146 British subjects were thrust into a chamber 18 feet by 14, having only two apertures through which the air could be admitted. They were shut up at eight o'clock at night, and we are told that the bad effects were felt in a few minutes. Before eleven o'clock one-third of the whole number were dead, and at six o'clock next morning only 23 came out alive, most of whom were in a high state of putrid fever, and died subsequently.

While writing, I am in possession of cases of fever affecting several members of two families in this town, of eight and nine persons each, respectively occupying one small apartment, and this fever I have not the least doubt was generated originally by such causes as have already been detailed. In another house, where sickness

and fever has also been prevalent throughout the past summer, I find nearly fifty persons of various ages present, averaging eight to each small room ; and, in a workshop unsuitably situated, and inadequately ventilated, I find the majority of the men frequently incapacitated from work by indisposition, the symptoms of which are clearly referable to these causes, but, without multiplying these, I without hesitation affirm that such predisposing causes of sickness and mortality, are numerous in Birkenhead, and, as surely as noiselessly, hastening the unsuspecting sufferers through malignant disease to eventually premature graves.

Here then is, at our own doors, ample scope and opportunity for that interference and guardianship which, as far as practicable, is due to our dependent poor. Our business should be to recommend remedial measures to their judgment and affections, to give them facilities, help, and encouragement, and thus make themselves the agents of ameliorating their own condition.

Before proceeding to the further consideration of those extraneous causes which chiefly induce



and aggravate bodily distempers, I may be allowed to offer a few remarks on one of the most prevalent, and the most destructive, viz.—fever, in all its various forms, as intermittent, remittent, typhus, &c. Dr. T. Southwood Smith says, in his evidence on sanatory subjects, “that of all the acute diseases to which the human frame is subject, during that variable, but most important, period of life which intervenes between puberty (when the dangers of infancy and childhood have been passed) and old age, of all the acute diseases which cut short this, the most precious part of the term of existence, and the *only* part of that term which it is in the power of human precaution and wisdom to extend indefinitely, fever is incomparably the most prevalent; so prevalent, indeed, that it may be said to be *the* disease of adolescence and manhood. Dr. Smith goes on to say that he was taught this fact while making some researches into the cause and results of fever, derived chiefly from the records of the Fever Hospital, and as long ago as the year 1830 he published a table exhibiting the evidence of it.

He took out, one by one, the ages of all the persons who had been admitted into that hospital during the four years, from 1825 to 1828, both inclusive, being the four years immediately preceeding the year in which he was making the investigation. The results of Dr. T. Southwood Smith's researches are most instructive and important, and are shown in the following table.

TABLE OF AGES OF PERSONS ATTACKED WITH FEVER.

Age for 1825.	Age for 1826.	Age for 1827.	Age for 1828.
Under 10 .. 42	Under 10 ... 27	Under 10 .. 25	Under 10 .. 31
15 .. 67	15 .. 87	15 .. 70	15 .. 80
20 .. 172	20 .. 170	20 .. 163	20 .. 136
25 .. 133	25 .. 143	25 .. 164	25 .. 107
30 .. 81	30 .. 102	30 .. 107	30 .. 84
35 .. 29	35 .. 46	35 .. 35	35 .. 47
40 .. 28	40 .. 37	40 .. 50	40 .. 45
45 .. 10	45 .. 28	45 .. 20	45 .. 21
50 .. 10	50 .. 13	50 .. 13	50 .. 17
55 .. 10	55 .. 7	55 .. 8	55 .. 6
60 .. 1	60 .. 5	60 .. 13	60 .. 14
65 .. 1	65 .. 3	65 .. 2	65 .. 6
70 .. 2	70 .. 3	70 .. 4	70 .. 1
75 .. 1	75 .. 4	75 .. 2	75 .. 2
80 .. 1	80 .. 1	80 .. 0	80 .. 0
85 .. 0	85 .. 0	85 .. 0	85 .. 0
Total .. 588	Total .. 676	Total .. 676	Total .. 597



Medical statistics also acquaint us with the fact that, in general, females are more frequently attacked and prostrated by fever than males, and which, occurring as we have seen at a period of life when most probably young families are dependent, when maternal supervision and anxious cares are demanded by a helpless offspring, at that identically critical period, too frequently, the mother is disabled from nursing, or ministering to their wants; of course, disorder and distress quickly supervene, and, not rarely, husband and children also become similarly affected, and the melancholy scene closes in a manner the humane mind and benevolent Christian shudder to contemplate.

TABLE SHOWING THE PROPORTION OF SEXES  
ATTACKED WITH FEVER.

1825	1826	1827	1828
Males .... 289	Males .... 325	Males .... 337	Males .... 278
Females .. 299	Females .. 351	Females .. 339	Females .. 319
<hr/>	<hr/>	<hr/>	<hr/>
Total .. 588	Total .. 676	Total .. 676	Total .. 597

I also give a table taken from Dr. Southwood Smith's report, in which he remarks that among

other curious and instructive results it was found that the mortality of fever resolves itself into the following remarkable progression. Thus, suppose 100,000 patients to be attacked with this disease between the age of five and sixteen, of these there would die 8,266; and of an equal number—

Between	15	and	26	there would die	11,494
„	25	„	36	„	17,071
„	35	„	46	„	21,960
„	45	„	56	„	30,493
„	55	„	66	„	40,708
„	65	and upwards		„	44,643

Thus the risk of life from this malady is twice as great at the age of thirty-one as it is at eleven; it is also nearly twice as great at forty-one as it is at twenty-one; it is five times as great at sixty-one as it is at eleven; and nearly four times as great above sixty-five as it is at twenty-one.

By this calculation, although the rate of mortality in fever progressively and rapidly increases as age advances, yet the number of persons who actually perish by this disease at the adult age, and in the meridian of life, is far greater than at any other period of existence,—on account of the much greater number of persons who are attacked

at these epochs. This table shows that between twenty and thirty the greatest number is attacked with fever, but according to this calculation the risk of life from this disease at the age of thirty-one, is just double the risk it is at the age of eleven.

If, from some fortuitous circumstances the younger members are (I almost hesitate to say it), fortunate enough to escape with life, still they are, as a consequence, invariably predisposed to contract acute fevers, small pox, measles, &c.; are more susceptible of malignant influences, and are very likely to prove weakly in constitution, and eventually to become chargeable to the township; for the indirect action of fever, though the evil may not at first be manifest, is nevertheless highly noxious, often disturbing the function of some organ, or set of organs, thereby weakening the general system, and inducing some of the most common and fatal maladies.

In confirmation of this constant liability of increased demand upon the rate-payers through want and sickness of the nature alluded to, I have constructed the following table of relief afforded to all paupers, during the past year.

NUMBER OF PAUPERS RELIEVED IN THE TOWNSHIP OF BIRKENHEAD IN 1846.

DATES	Aged, Infirm, &c.		Illegitimate Children under 16, with their Mothers.		Widows, and Women whose Husbands have deserted them, having a Child or Children under 16 dependent on them.		On Account of Sickness or Accident.				Out of Work and other Causes.				Vagrants and Paupers not belonging to any Parish of the Union.	
	In-door.		In-door.		In-door.		In-door.		In-door.		In-door.		Out-door.		Out-door.	
	Adults.		Children.		Children.		Children.		Children.		Children.		Children under 16.		Children under 16.	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
Quarter ending Mar. 25,	1	2	11	12	5	7	6	5	12	12	0	1	0	0	94	56
June 24,	2	3	5	6	3	5	5	2	25	19	0	1	0	0	33	33
Sept. 25,	2	2	2	3	1	0	5	0	62	37	4	4	1	0	86	66
Dec. 25,	2	2	5	3	2	4	8	2	66	88	4	0	0	32	288	172

[LAST TABLE CONTINUED.]

DATES	Quarter ending	TOTALS.															
		Orphans, Foundlings, of Children of widows remar- ried—age un- der 16.				Insane Per- sons, Lunatics, and Idiots.				In-door.				Out-door.			
		In-door.	Out-door.	In Asylum.		Males.	Females	Children under 16	Total,	Adults.		Children under 16 in- cluded in the preced- ing Columns.	Children under 16 re- moved with their Pa- rents, as per Out-Re- fuge List, and not in- cluded in preceding columns.	Total.			
				Males.	Females.												
										Males.	Females.						
															Males.	Females.	
Mar. 25,	10	0	0	0	6	26	29	61	107	79	0	110	296				
June 24,	13	0	2	2	4	16	23	43	60	65	0	51	176				
Sept. 25,	9	10	2	2	6	9	13	28	150	116	10	134	410				
Dec. 25,	11	2	1	4	8	13	19	40	387	306	2	426	1121				

From which it will be seen, that presuming accidents to be almost nominal, the greater proportion have really been compelled to apply through disease, and its consequent destitution; again evidencing, that there can be no larger economy than well-directed sanatory measures of prevention, and that the pecuniary losses to a community from preventible causes are little considered, and often greatly under estimated.

Serious as are the results to be gathered from an inspection of the above record, still, all the evil, misery, and loss, do not end, nor are they indeed, apparent here.

In cases of sickness, where application is not made to the union, much suffering is endured in secret, which does not meet the public eye. It is calculated that the pecuniary consequences of the preventible excess of deaths are set down at an average expense of £5 for each funeral; beside which, it is found that, for every death in excess, there have been at the least twenty-eight cases of sickness in excess; the expense of which cannot be less than £1 per case. Beyond



this, the premature death of an adult labourer involves a loss of productive labour, averaging not less than 10s. per week for each male, and 5s. for each female, or 7s. 6d. per week male and female; which for all classes, skilled and unskilled labourers, will be a low average loss beyond the prime cost of their maintenance. It has also been demonstrated as a general law, that amidst large masses of people the ravages created by excessive mortality are more than made up by an excess of births; and that pestilence, instead of diminishing, rather increases the number of the population.

No one living in, or near a malarious district, or inhabiting a dwelling subject to similar baneful influences, is ever for a single hour, I may say, free from disease of the digestive organs, which through misconception of the origin, is tampered with or maltreated, entailing an enfeebled condition of the patient, and an incapacity of resisting the frequent and sudden changes of temperature, to which we are all so much exposed in this country; even amongst medical men themselves, who have not sufficiently studied the subject, great

misapprehension occasionally prevails, and illness is not unfrequently attributed to wrong or secondary causes.

The well-known unhealthiness existing where a number of children are assembled in low, close, ill-ventilated school-rooms, or apartments, would seem sufficiently evident not to need a word of caution or advice; the insalubrity is often too apparent to one or other of the senses to escape remark. A mere recital of the many morbid liabilities would alone almost excite incredulity; but it is a true observation, that sore eyes, affections of the joints, diseases of the skin of a troublesome character, and indeed hydrocephalus, may all be induced by inattention to ventilation.

The most sensitive organs of the body, as the eye, the ear, &c., are inevitably the first affected; contact with vitiated air, for example, thickens or indurates the membrane of the ear, destroying its delicate organization, and causing deafness; indeed it is a curious well-confirmed fact, that double the number of children of the labouring classes are affected with ear ache and deafness than children



of the rich; the comparison, too, will extend still further—there is a marked disproportion between the number of children actually reared in the different classes of society, and likewise that proportion varies, in exact gradation, as they rise in command of an adequate supply of the conveniences and comforts of life.

From all these instructive and well-ascertained facts, I am fully warranted in the assertion, that air, pure undefiled air, is more necessary to human life than food! If we have it not, we die; it is requisite also that we have it in bulk, and well for us is it, that no exclusive means of possession have yet been discovered,—were such possible, there is very little doubt but that the same restriction would have been adopted as with the light, and that the very air, “God’s freest gift,” would have been measured out to us by the cubic foot.

Dr. Watson, in his valuable lectures on the practice of physic, states it as a matter of doubt whether fever be really generated by accumulation of filth and foul air; but leaving this as an un-

settled point, it is most unquestionably allowed by the profession in general that want of pure air aggravates fever when it does appear, causes the pestilence to spread with astonishing rapidity, and in such a neighbourhood is found to be fearfully fatal.

Dr. Duncan justly remarks that the influence of these seats of pestilence is not confined to those who reside within their immediate limits, but extends itself to the whole town, poisoning the atmosphere which all classes are compelled to breathe. This appears from the following table, compiled from Mr. Chadwick's Sanatory Report on England, pp. 156, 161.

TOWNS.	AVERAGE AGE AT DEATH.			General Average.
	Gentry and Professional Persons	Tradesmen.	Labourers.	
Kendal .....	45 years	39 years	34 years	36 years
Bath .....	55 "	37 "	25 "	31 "
Four Metropolitan Unions	44 "	28 "	22 "	25 "
Leeds .....	44 "	27 "	19 "	21 "
Bolton .....	34 "	23 "	18 "	19 "
Manchester .....	38 "	20 "	17 "	18 "
Liverpool .....	35 "	22 "	15 "	17 "

So that all classes of the inhabitants are interested in effecting an abatement of these evils.

It is well known that decomposing animal and vegetable matters produce carburetted, sulphuretted, and phosphuretted hydrogen gases, with ammonia and its compounds, and when these aerial impurities surround buildings to any extent, the actual operation is that of a poison, and all living within their deleterious range are as much and literally poisoned as though some deadly drug was mixed with their food; there is no intention on the part of any one concerned to produce this result, but there it is, and in the one case it is as fit for prevention by society as the other, probably more so, as being a sedative poison, it induces mental apathy and physical listlessness, thus driving the unhappy victim to the use of stimulants, a sure prelude to increased bodily suffering, intellectual debility, and moral aberration.

Dr. Allison, in his admirable Essay on the Management of the Poor in Scotland, proves that the prevalence of contagious fever amongst the lower orders is always in direct proportion to their state of physical destitution. The association of pesti-

lence with famine is proverbial. But Dr. Watson again says, that we do not find continued fever ever created by the mere want of nutriment. In persons who have sought to starve themselves to death, among sailors who have been of necessity kept on very short allowance of food, we find that disease is produced by the privation of nourishment, but it is not continued fever. This, however, along with impure air, acts as a predisposing cause, rendering the human body more susceptible of the exciting cause, which is a specific animal poison. The following table shows the average deaths from fever in six of the principal towns in England, to which I have added the average mortality of Birkenhead and Tranmere for last year.

## DEATHS BY FEVER.

TOWNS.	Proportion of Fever Deaths to Population Annually.
Manchester .....	1 in 917
Leeds, Parliamentary borough.....	1 in 849
Metropolis.....	1 in 690
Manchester .....	1 in 498
Liverpool and West Derby .....	1 in 488
Liverpool parish .....	1 in 407
Birkenhead .....	1 in 313 $\frac{3}{4}$
Tranmere .....	1 in 744 $\frac{1}{4}$

It is almost unnecessary for me to make any comment upon the above, the table speaks for itself, but it certainly is a matter of serious moment to think of the heavy average of deaths by fever in Birkenhead, the cause of which ought, I think, to be a matter for investigation; and there never was a time more urgent, or better fitted for such an enquiry than the present. There are thousands of people now in almost utter starvation, and should fever of a malignant type make its appearance, where is it to end? Not, certainly with the poor and lower classes, but all

classes will most probably participate in the evil, and what the result may be is fearful to contemplate.

If prompt and energetic measures be adopted, it may, comparatively speaking, be kept within narrow bounds. Could the sick be at once removed from their crowded homes to a fever hospital, and their impure apartments be ventilated and whitewashed, the disease might in a great measure be checked, if not entirely stopped, and the healthy individuals in the district be preserved from its influence. Although we certainly have a Dispensary and Infirmary in Birkenhead, which has during the year 1846 given relief to 2558 out and home patients, and accommodation to 193 patients in the house, still it must be borne in mind there is no ward in this Infirmary, or any other place in Birkenhead, for the reception of individuals attacked with fever. On the bed the patient is first laid down, there he must lie until the disease runs its course, with perhaps a family of five or six all living in the same small apartment, and very probably some of them sleeping in the



same bed. This I have repeatedly witnessed in Birkenhead, and at this moment I am attending a poor family where the husband is prostrated by typhus fever, in a very small room, and three of a family actually sleeping in the same bed with him. Such cases as this, I think, pretty well account for the heavy average of mortality from fever in Birkenhead; and it never can be otherwise unless proper sanatory measures be adopted for the prevention, in some degree if possible, of this fearful disease, and a place provided to receive such patients when they are attacked.

Sir James Clarke, in his work on the sanative influence of climate, remarks, in alluding to the causes of pulmonary consumption—"Whatever deteriorates the health may lead to tuberculous cachexy; residence in a low, damp, and chilly atmosphere; long confinement to close, ill-ventilated rooms, whether nurseries, school-rooms, or manufactories; deficient exercise in the open air; improper food, either deficient in quantity or of innutritious quality, or the habitual use of an over stimulating diet. In short, imperfect digestion and

assimilation may induce tuberculous cachexy; and the earlier in life these causes are applied, the more rapidly in general will their effects be manifested. The offspring of the healthiest parents may thus become tuberculous in early life, if long exposed to the excited causes enumerated." Sir James Clarke also remarks in alluding to the construction and ventilation of houses. "Nothing, indeed, can be constructed on a worse principle than the bed-rooms in this country generally are. Their small size and their lowness render them very insalubrious, unless well ventilated; and the case is rendered worse by the close windows, and by the thick curtains with which the beds are so carefully surrounded, as if to prevent the possibility of the air being renewed. The consequence is, that the occupants are breathing vitiated air during the greater part of the night, that is, during almost one-half of their lives." These statements are not one iota too highly coloured, therefore it ought to be the desire of every individual to see such evils corrected, but this can only be accomplished by the united exertions of



the community in general; if this was done what numbers of valuable lives might annually be saved!

How often do we see a supply of pure air, the most important provision of a beneficent Almighty prevented, almost purposely frustrated, by the construction of nests of contracted tenements in courts or alleys, skilfully contrived to admit but little of it, and yet subjected to the full influence of heat and moisture; is it surprising then, that in these fostering hot-beds of death and disease, experience teaches us to look for all the "ills that flesh is heir to" in their greatest aggravation? One such "hole" (in the vicinity of the market,) has lately come under my notice, where the ingress is only about three feet in width, the entire of which was for some time untenanted, solely through these objections, and a fear of the consequences observed in previous occupants.

Philosophic contrivances and philanthropic efforts will still be unavailing and fruitless, unless the vital importance of ventilation be known and felt by the higher classes of the community generally; for meeting inattention or ignorance where

we might expect least to find it, it can scarcely remain a matter of wonder, that as we descend the social scale, such apathy on the subject should more extensively prevail. But so it is, and I have observed with astonishment the whole number of bed-room and other windows in our principal square, as well as in numerous houses of a first-class character in various parts of this town, at the noon of a fine clear day, as hermetically closed as if the admittance of a portion of good fresh air was to hurry the inmates to an untimely grave—and what are the consequences of all this especially amongst children? let medical experience again answer—complaints of the digestive organs, head, limbs, and even scrofula, for though other causes may produce it, yet defective ventilation can almost always be traced as one of the agents, besides, should this disease be at all hereditary, impure air is a most powerful predisposing agent for calling it into action.

It is at all times more easy to condemn than to invent, and in accordance with this long received axiom, I confess, that although I see in a theo-

retical point of view, much to admire in many of these numerous, ingenious inventions for room ventilation, which I have examined, yet I fear most of them will be found of little practical utility in the dwellings of the working classes; those capable of graduation, and dependent on the inmates themselves, will always be liable to whim and caprice foreign to their intention, and as all experience has shown, end in being blocked up altogether.

But although I state this relative to the houses of the lower classes, yet I am far from holding the same opinion with regard to these mechanical inventions when applied to first-class houses, or public buildings. However, to return to the houses of the poor, I do believe that after all mechanical inventions have been exhausted, it will be found that the only means really applicable for the purpose of ventilating them, will be found to consist in rightly constructed windows, doors, and fire places, the windows and fire places to be made of proper dimensions, and the former also should be made to draw down from the top, so as to give

an outlet for the vitiated air, which always ascends; and it is for those having competent knowledge, to step forward and point out to the poor and uninformed, the true and unfailing causes of disease, to impress them with the duty and gain of preserving their own health by attention to the use of the simple means thus always, under their own control. This, however, or any other plan for ventilation, can only be effectual where sanitary measures sustain a pure external atmosphere by effective drainage, cleansing and prevention of nuisances: without such, no system of ventilation can be successful. As to the public buildings generally speaking, none are more defective in ventilation than churches, no systematic means being adopted for regulating the ingress and egress of air. As Dr. Reid remarks, "the consequence is that the air becomes loaded with carbonic acid and the moisture of the breath, and with products from the combustion of gas, oil, or candles; chilling draughts from immense surfaces of glass, inequality of heat; in some churches emanations from grave yards by which they are sur-

rounded, and sometimes from dead bodies under the pews, in the very centre of the church; and in some places the poisonous emanations of an open charcoal chaffer or braizer, passing directly from the corridor into the church." Now all these may be observed as producing most deleterious effects.

Dr. Reid also goes on to say, "In these churches in which I have watched the progress of the influence of vitiated air, as the service proceeded, on individuals whose constitutions were not previously rendered dead to the influence of pure air by the state of the atmosphere to which they were accustomed at home, a slight and marked flush in the countenance usually appeared in a short time; this was soon succeeded by a sense of heat and oppression, and a tendency to sleep, more or less marked according to the condition of the atmosphere, and the extent to which the attention was engaged. The soporific influence in some cases was a source of annoyance to the conclusion of the service, but was succeeded in others by a reaction. The pulse rose, the circulation was accelerated, the brain became stimulated, and relief was at the

same time afforded by the insensible perspiration (which had been arrested by the state of the air) becoming gross and sensible. Attention could now be sustained, but head-ache, more or less severe, was the usual consequence, and liability to dangerous colds and rheumatisms, when the body was suddenly exposed to the chilling influence of the external atmosphere, while still affected in the manner described."

It is scarcely necessary to state, that these remarks apply to very crowded and ill-ventilated churches, and more particularly to those in which there are galleries.

My object in giving these quotations of Dr. Reid's is, with the view of bearing me out in my statements as to the injurious effects produced on the human frame, from want of attention to the laws of ventilation. As to the most effective means for obtaining and maintaining a pure atmosphere in public buildings or dwelling-houses, it is a subject of such importance, and upon which volumes have been written by eminent and scientific men, that I feel it would be unbecoming of me, in this



little treatise, to enter further on the subject, I will, therefore, proceed to make a few remarks on

## DRAINAGE.

If insufficient ventilation, or poisonous malaria, be aided by damp, either from situation or ill-contrived drainage, then does disease run riot, and, with this hateful ally in conjunction, but few are found who, for any time, can resist their attack, mercilessly undermining general health and physical condition, and generating acute, chronic, and ultimately organic disease.

To a common-place observer, the first consideration and primary important step, in the erection of a house for habitation, would seem that of securing and preserving a dry and healthful basement; but architects and builders generally appear to manifest more anxiety, and to bestow superior regard on the elevation and decorative exterior, than the future tenant's comfort or convenience. Whether from this, or a mistaken notion of

economy, certain it is, that this part of the structure is usually slighted and performed in a highly unsatisfactory manner, and with a perfect disregard of sanitary principles.

In my repeated examinations of the new streets and dwellings here, I find, that although the township has been with admirable foresight amply supplied with good and sufficient main sewers, so much so, that I may with confidence assert Birkenhead to be one of the best sewered towns in Britain, as the following statement shows:—

#### RELATIVE LENGTH OF SEWERAGE IN BIRKENHEAD.

Name of Street.	Breadth.	Length of Surface.	Length of Sewers.
	Feet.	Yards.	Yards.
Argyle-street.....	60	700	450
Bidston-road .....	60	830	830
Beckwith-street.....	60	1,350	1,350
Cleveland-street.....	60	2,150	2,150
Conway-street.....	60	3,330	3,180
Clayton-road .....	60	780	780
Dobbs-street or Park- road East .....	60	560	560
Hamilton-street .....	60	650	400
Livingston-street ....	60	480	480
Prices-street .....	60	2,400	1,810



Name of Street.	Breadth. Feet.	Length of Surface. Yards.	Length of Sewers. Yards.
Park-road West.....	60	920	920
Vittoria-street .....	60	180	180
Circular-road.....	60	215	215
13 streets ...		14,540	13,305
Arthur-street.....	50	410	410
Wellington-street ...	50	580	580
Mallaby-street.....	50	220	220
Public road through the park .....	50	1,250	1,250
Duke-street .....	50	480	260
Catheart-street .....	50	680	680
Prince Edward-street	50	180	180
Cavendish-street ....	50	510	510
Norman-street,.....	50	580	580
9 streets.....		4,890	4,670
Market-street.....	45	170	170
Rendel-street.....	45	210	210
Freeman-street .....	45	180	180
3 streets .....		560	560
Wilbraham-street ...	42	140	140
Jackson-street .....	42	300	300
2 streets.....		440	440
Chester-street.....	36	930	810

Name of Street.	Breadth. Feet.	Length of Surface. Yards.	Length of Sewers. Yards.
Church-street .....	36	610	610
Ivy-street .....	36	550	—
Pilgrim-street .....	36	—	200
Brook-street .....	36	1,850	1,850
Watson-street .....	36	470	470
Trinity-street .....	36	180	180
Brassey-street .....	36	900	900
Old Bidston-road ....	36	560	560
Market-street .....	36	520	520
Sandford-street .....	36	240	240
Grange-lane .....	36	1,060	1,060
Argyle-street .....	36	130	130
Grange-road .....	36	700	700
Bridge-street .....	36	1,100	1,100
Euston-grove .....	36	370	370
Canning-street .....	36	450	450
George-street .....	36	200	200
Chapel-street .....	36	150	150
Taylor-street .....	36	210	210
Abbey-street .....	36	280	280
Priory-street .....	36	260	260
Pool-street .....	36	190	190
Bidston-road .....	36	750	750
Clifton-park .....	36	150	150
St. Anne-street .....	36	1,200	1,200
Park-street .....	36	560	560
Ball's-road .....	36	530	530
Claughton-road .....	36	1,120	1,120
Cole-street .....	36	130	130
Lord-street .....	36	400	400
Duncan-street .....	36	85	85

Name of Street,	Breadth. Feet.	Length of Surface. Yards.	Length of Sewers. Yards.
Hampton-street .....	36	70	70
Atherton-street .....	36	140	140
Monk-street .....	36	70	70
Camden-street .....	36	450	450
Oliver-street .....	36	1,130	1,130
Queen-street .....	36	165	165
Exmouth-street .....	36	380	380
Corporation-road ...	36	3,550	3,050
40 streets ...		22,990	21,620
Vittoria-street .....	30	345	345
Charles-street .....	30	75	75
Neptune street .....	30	190	190
Arthur-street.....	30	80	80
Somerville-street ...	30	300	300
Rose-brae .....	30	170	—
Clare-street .....	30	150	150
Leicester-street .....	30	100	100
Slaty-lane .....	30	750	750
Russell-street.....	30	80	80
Kenyon-street .....	30	180	—
Forest-road .....	30	800	—
Oxton-road .....	30	1,150	600
Old Chester-road ...	30	210	210
14 streets ...		4,580	2,880
Berner-street .....	24	75	75
Pool-street .....	24	330	330
Henry-street .....	24	240	240

Name of Street.	Breadth. Feet.	Length of Surface. Yards.	Length of Sewers. Yards.
Grange-street .....	24	110	110
Meacock-street .....	24	65	65
Wetstone-lane .....	24	120	120
Willaston-place .....	24	55	55
Back Chester-street.	24	225	225
8 streets.....		1,220	1,220
John-street... ..	18	285	285
Albion-street .....	18	70	70
Oak-street .....	18	240	240
Chapel-street East...	18	80	80
West Back Camden-st	18	160	160
Hamilton-lane.....	18	150	150
Wood-street .....	18	400	400
7 streets.....		1,385	1,385
Back Market-street..	15	165	165
Wood-street .....	12	275	275
Sth Back Camden-st.	12	100	100
2 streets.....		375	375

In the foregoing Table some of the Streets are mentioned more than once, this only occurs when there are different breadths in the same Street.

## ABSTRACT.

Name of Street.	Breadth. Feet.	Length of Surface. Yards.	Length of Sewers. Yards.
13 streets .....	60	14,545	13,305
9 do. ....	50	4,890	4,670
3 do. ....	45	560	560
2 do. ....	42	440	440
40 do. ....	36	22,990	21,620
14 do. ....	30	4,580	2,880
8 do. ....	24	1,220	1,220
7 do. ....	18	1,385	1,385
1 do. ....	15	165	165
2 do. ....	12	375	375
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99 yards	...	51,150	46,620

It will be seen from the above table that there are 99 streets in Birkenhead, the aggregate length of which amounts to 51,150 yards, or 29 miles, 110 yards, of which there are 46,620 yards, or 26 miles 860 yards sewered, leaving only 2 miles, 1,010 yards to be completed; yet, through the absence of some compulsory power, or obligation, great unconcern is paid to the means at hand by owners and builders, and houses are erected, either insufficiently or wholly unprovided with the necessary adjuncts to the first requisites of clean-

liness and convenience, viz., drains connected with these sewers.

Birkenhead is considered a most salubrious town, principally on account of its superior sewerage; but, I may ask, what benefit is there in having a sewer running down the centre of a street, past the very doors of the dwelling-houses, when in many of these streets not one single drain leads from the houses into the said sewer? the filth is accumulated in and around the houses, and so it must remain, there not being a single outlet for its escape; but still all is considered right, merely because the sewer is there. An instance to the point lately came under my observation. In the lower part of a house, where there had been for some time continual sickness, I found an accumulation of water, thus accounting, in a great measure, for the ill health of the inmates. And in talking to the parties interested on the subject, I enquired if the street was not properly sewered, "Yes," was the reply, "no fault can be attributed to the want of sewerage;" but after a closer investigation, I discovered that not a single

foot of drainage proceeded from the house into the sewer, and, therefore, there was no possible way of escape for this accumulation of water: the parties concerned immediately took the proper means to get a drain in connection with the sewer, and from that date until now there has been no further unhealthiness or complaint of damp in the house.

In fact, sewerage, drainage, and a *super-abundant supply of water*, must be looked upon as inseparable, the one without the other is unavailing. Without house-drains sewers are useless as regards dwelling-houses, and without a constant and sufficient supply of water to wash the filth and other accumulation through these drains into the sewers, the drains become worse than useless.

I have also noticed that, where house drains are introduced, they are too frequently connected with that domestic abomination—a cesspool, of which there are at present in Birkenhead the incredible number of 2405. Now, *these* are in themselves plague-spots of corruption, offensive to the senses, prolific of disease, and



constantly recurring sources of expense and annoyance. I have remarked one in Meacock's court, Back Chester-street, simply covered with a wooden lid; this was stated to be constantly full of the overflow from an adjoining privy, and opening at the door of a cottage caused unpleasant smells, which in the opinion of the tenant, produced serious and continued illness, both husband and wife being confined with fever at the same time.

These annoyances are often very inconsiderately placed in the dwelling itself, occasionally testifying their presence in a manner not to be mistaken, and with a more than satisfactory assurance, that no portion of their odours had at any time miscarried. One instance occurs to my recollection in Pilkington's court, Back Chester-street, where, in a cellar, there is one merely covered with a flag stone, the effluvium emitted, through the inattention of the night-men to an adjoining privy, was described as most nauseous, pervading the whole house, and rendering it at times quite insupportable. This is never emptied, but ebbs and flows according to the state of the reservoir

aforesaid. I observed another, nearly as offensive from stagnant and putrid water, collected from the overcharged street gutters in rainy weather, in the sole room occupied by a shoemaker and his family, on the Chester-road; this also had only a loose wooden lid, by no means air-tight, and the floor was so pervious to wet and damp, that the feet of the bedsteads were placed upon bricks. As may readily be supposed, almost constant sickness has been present in both these instances.

I have remarked also, that these drains, where existing, commonly traverse the extent of the house, giving out, from time to time, exhalations and smells equally unpleasant and injurious, and keeping the lower part of the house constantly damp. In Grange Vale-terrace, amongst numberless others, which it would be tedious to specify, I found the kitchen in a large house actually deserted from this cause; the walls and floor were reeking with wet; and from its highly favourable humidity, a cabinet-maker had selected an otherwise good apartment for some process of seasoning or preparing his timber. In Birkenhead

especially, this is materially assisted by their faulty construction; instead of being conduits, or pipes, carrying off readily any refuse liquid, they are too frequently made of the common rubble stone, abundantly found in sinking foundations; these being laid down undressed, offer angles and obstructions to the passage of any matter in solution; and in a very short time these angles render the drains choked, useless, and the receptacles of filth. The formation of drains by bricks, is almost equally faulty, and not calculated to effect any good end; being square is decidedly objectionable for such purposes, the angles again act as impediments, and the materials being absorbent, is highly susceptible of frost, breaks up, and produces similar results to those already described, and which are by no means confined to the immediate locality, for the repugnant odours, and deleterious effects from neglected drains, may be traced even to the top of a house, pervading all parts of the dwelling in its ascent. As a proof of the value and effect of drainage when done, I will recur to a case I have noted of a house in

the Old Chester-road, which being on the lower part of a decline, was subject to all the effects of the liquid filth and night soil, which ran down to, and at times surrounded the house, and entered the very sitting-rooms for two years; after coming here, the family had no health, as it was termed, all were attacked with fever; but a drain having been formed, the evil was remedied, and a manifest improvement in the health of the inmates immediately took place, and has continued to this time, clearly showing the immediate and direct effect of the removal of offensive and deleterious substances.

These defects in drainage are not confined to the habitations of the poor, but exist also in those of the wealthy. Dr. Rigby, in his evidence before the Health of Towns' Commission, states it as his opinion that, in a large majority of cases, the ventilation of private houses is very inferior to that of our large hospitals, more especially as regards the effluvia from drains, &c.

Dr. Rigby also remarks the want of proper arrangements for ventilating the sleeping-rooms of dwelling-houses, especially the servants' bed-rooms,

which in general are very defective; the peculiar, close, disagreeable smell of these latter chambers must be familiar to all. I consider that there is nothing so apt to cause that fearful disease, puerperal fever, as the effluvia from foul or choked up drains; and I have known several cases of it, which I could impute to no other cause. Dr. Rigby states, that he knew one family, the members of which were constantly exposed to the effluvia and stench arising from bad drains; they never had a cook remain with them long without suffering severely in health; as the state of the drains became worse they all suffered, and at his urgent advice, removed to a healthy suburb of London, with the most marked effects in the improvement of health. These defects, as regard effluvia and stench, arising from defective drainage, exist also among houses comparatively or quite new; for instance, in the Marylebone district, and even among some of the recently built houses of Hyde Park. In the former locality, he was at that time attending a lady in her confinement, whom he with some difficulty rescued from an

attack of puerperal fever, which threatened to assume the malignant form. On being summoned to her when in labour, he was struck by the offensive drain effluvia, which not only pervaded the lower parts of the house, but rose perceptibly from the area as he stood at the hall door, and he could not help attributing this attack coming on, under all the favourable circumstances of wealth and station, to the deleterious influence already alluded to.

This also is a matter on which some one-sided and erroneous ideas of "expense saved" undoubtedly exist; but it seems to me evident, that as tenants soon discover the presence and consequence of bad drainage from frequent attacks of colds, sore throats, and rheumatism, that the loss sustained by non-occupancy, and the progress of decay and dry rot, must speedily convince the most niggardly, of the sounder policy of doing better at the outset what must of necessity follow, but never can be so thoroughly done afterwards.

I know an instance in point, of a newly-built



terrace in Grange-lane, of some pretensions, but erected without these ordinary requisites, and at a recent visit, I found that the owner had been compelled to supply the omission of drains both in front and at the back, after the houses were completed, of course at an increased outlay and with additional trouble; and who shall say how often, or whether it is not generally, that this evasion of cost and petty saving is not eventually entailed upon the community at large? Illness more commonly assails those either living, or daily occupied in the close vicinity of those pestilential sources, and they are the very classes most likely to apply, shattered in health, for that parochial assistance which, under better arrangements, probably would not have been required. It is also questionable in my own mind, if, on the score of cost even, the present practice can be successfully defended. Tiles of an unexceptionable form and manufacture, sufficiently large and with glazed inner surface have been used with much approbation, and, making due allowance for the lesser labour in



placing, and their superior durability, these will I think be found as much cheaper, as they certainly are more efficient and eligible.

In the case, also, of sites selected for the foundations of new buildings, I perceive an equal want of that care due to the preservation of health, and too frequently, the abodes intended for those who are condemned by the necessity of local circumstances to dwell in such, are raised in situations, as little suitable for the purpose, as any one could possibly imagine. In St. Anne-street, partly built in a damp site, I have observed that the greater part of one side has the back yard closely built up by stabling, &c. and there being no drainage, or other means of escape, the liquid manure from the stables finding its way into the premises with the rain water from the roofs, keep them constantly damp and uncomfortable, and in summer, as a resident said, "they are so infested with flies and vermin, sure harbingers of filth, as to resemble the plague of Egypt."

Length of practice seems to have established it as prescriptive that, as a building must be in the

spot required by the exigencies of the working plan, which is not to be departed from, so also, may the excavator coolly proceed to his portion, alike indifferent whether it is wet or dry, a rock or a quagmire; and as Birkenhead with its anomalous appearance, a literal "*rus in urbe*," abounds with both, even a careless observer may notice that a swamp or a pool is as often the lot as any other, and the edifice rises, enclosing within its walls a body of water, never of the purest, left to escape as it may, by evaporation or otherwise, or if likely to be troublesome, or any suspicion of a spring exists, instances have come to my knowledge of such being slightly arched over, thus concealing in ambush a deadly foe, perpetually carrying off its victims, and sapping valuable life unseen and unsuspected. The more charitable view to be taken of this flagitious conduct is, that of consummate ignorance on the part of all concerned, but it has often occurred to me, whether this is not one of those matters which society holds in charge for behoof of its constituents generally, and when it is bound to interpose, and overrule any

such irregularities of private property, which prove themselves to be destructive of public health, and subversive of individual enjoyment.

Occasionally I have observed, that attempts even at improvement, unless effected under proper direction or regard for sanatory principles, actually fail of their purpose, and become really nuisances. In Coalbrook cottages, Waterloo-place, a new privy has been erected by the landlord, without the precaution of cleansing or draining the old one, but merely placing a flag stone over the cesspool; in consequence, the offensive matter enters an adjoining cottage, and so saturates the coals lying near, that in burning they emit a horribly sickening smell, inducing nausea, &c.

I have also known, in these cases, a second and serious expense incurred in remedies, which might have been altogether avoided by original fitting measures. Yes, after the infliction of sickness, possibly death, or at least the endurance of much discomfort and loss by the tenant, something like drainage has been at last attempted, and the lower walls dug around, slated, and cemented.

But here, again, the objectionable stone, of a porous quality, sparingly bound with mortar, unless itself protected by some such method, is no proof against leakage into the house from collections of water outside, and the effects of which to the building itself are enduring and irradicable.

One instance I remember observing in a house in Chapel-place, Oliver-street, where I perceived the lower room quite uninhabitable—indeed it had been abandoned. And another tenant in the same row told me that colds and illness had prevailed in her family ever since their entrance, and that she had ascertained the previous occupant had quitted for the same reason.

These are great evils, but they are also to a very large extent remediable; and the enactment of sanatory laws and stringent measures will alone serve to put down the mischief, and diminish the sufferings connected with them.

Amongst what might at first sight be considered the minor evils resulting from want of drainage, were it not for the crowd of attendant detestations

ever in their train, is the frequent annoyance to dwellings from the propinquity of privies, and their noisome accompaniments. In Evans'-place, Back Chester-street, is an instance of several houses much incommoded by the overflow from an adjoining yard, which permeates the walls, and traverses the floors underneath, causing constant damps and noxious bad smells. In another case, in Back Chester-street, this occurs in such a degree as to destroy everything edible placed in the cupboards, and compelling incessant cleansing of furniture and domestic utensils, from the filthy, dark-coloured deposit collected upon them: the smell here is stated to be at times awful! And I can invariably trace the combined effects of these several nuisances in the presence of some malady, more or less active. I am in possession of numerous cases, similar in all respects to the above, some with more aggravated and disgusting features, but all corroborative of the defects pertaining to our present municipal systems, and the growing necessity of some legislative interference.

A striking instance of the injurious effects aris-

ing from inattention to the state of house-drains, occurred in Edinburgh a few years ago. The inmates of a first-class house were continually subject to attacks of fever; on this account, tenant after tenant left the house, until it was at last totally abandoned, not, however, before whitewashing, ventilating, fumigating, and, in fact, everything that art could suggest had been done to remedy the evil, but without effect. Accidentally it was discovered that one of the house-drains was choked, and consequently the drain was filled with filth; this was put right, the house again inhabited, and fever has never since made its appearance within its walls.

There are few places, I conceive, where attention to drainage is of more vital importance than it is in Birkenhead, the soil being principally composed of a stiff clay, whatever rain falls from the heavens lies on the surface, there being no natural capabilities of escape; consequently where house drainage is so exceedingly defective as it is here,—very few houses, comparatively speaking, being drained,—all refuse water and filth accumulate about the



dwellings, saturating the surrounding ground, and infesting the atmosphere with the exhalations arising from these pestilential impurities.

It is a fact, perhaps not generally known, that for 12 hours out of the 24 no drainage whatever takes place here, owing to the influx of the tide. At half-tide the water reaches the outfalls of the sewers, thus preventing any escape from them, and continues so until after three hours of ebb water, when the sewers are again above the level of the receding tide.

There is a matter connected with drainage to which I would wish to draw some attention: I allude to the necessity of having house-drains and gully holes trapped in a sufficient manner, so as to prevent the escape of deleterious emanations. This I look upon to be of the utmost consequence in a sanatory point of view, and I regret to say that it has been much overlooked in Birkenhead.

Before leaving this subject, I may remark, (although in no way connected with sanatory matters), with regard to sewerage, it has long since been testified by the successful practice of certain large



towns, both in our own country and on the continent, that the products of town drainage under a proper and practicable system, are amongst the most important kinds of manure, and that with all our present and daily increasing knowledge of the value of animal refuse, we are fitting out fleets for the collection of a fructifying article, which we are at the same time almost universally treating as a nuisance, and casting to waste. A vast body of Parliamentary evidence has been recently collected relative to the inquiry, and it seems to be unequivocally established by the testimony of agriculturists, market gardeners, and engineers from all quarters, that not only are its advantages decisive, but that no system of drainage can be deemed complete which does not provide for its conversion to a source of profit. Many curious and interesting calculations have been made as to the annual waste of ammonia, soda, and various animal and vegetable matters, which by exercise of skill might be made to accrue mainly towards the current expenses of a town, or indeed balance the whole charges, but as these do not come strictly

within my province, I must refer my reader to the various authorities substantiating these facts, and with a mere assurance that the statements will be found exceedingly instructive and incontrovertible.

Whilst offering, however, any strictures on the occurrence and repetition of mischievous practices, I am conscious that no universally sweeping anathemas of censure can in any case of this kind be strictly just, and I should much lament any supposition of their being applicable to all; on the contrary, without citing names, or making any invidious distinction, it may be honestly averred, that under existing arrangements, with the temptations which wealth and opportunity present to alienate man from his better feelings, less advantage has been taken in Birkenhead, and more consideration shewn, than could probably have been expected; still, that abuses do exist cannot be denied; and as prevention of a fault has long been held better than its reparation, I may be excused dwelling with some earnestness on topics so intimately affecting the condition of all. I am also not

unmindful, that to meet any remonstrances, the resort is held in readiness by landlords, or proprietors of the soil “Shall I not do what I please with my own?” and I am prepared with as decided an answer to the far-famed interrogatory—No, not absolutely. Your power depends upon laws and institutions for the *extent* to which it can be exercised; and, for its *duration*, must be limited by the well-being and interests of society. It has been well and repeatedly said that “Property has its duties as well as its rights;” and I also must strenuously maintain, that throughout this life and its chequered conditions, not merely those relations which belong immediately to our own hearths, but those too of neighbourhood and of common fellowship, unitedly form combinations in which we are all linked, and which, while they imply certain privileges, also impose particular obligations.

## MIDDENS, SCAVENGING, &amp;c.

Throughout universal nature, even a common observer must be arrested by the interesting and copious examples of the all-wise provisions of a beneficent Creator, calculated to render the habitable surface of this world as pleasurable to all his creatures as their organization will allow. No accidental impurity, marring its features, is allowed to remain an offence on the face of our earth. Almost every insect has its office; many animals are auxiliary; the elements combine; and every health-engendering particle is quickly removed by some external agency, from the annoyance of those delicate organs, evidently granted for the watchful perception of what is noxious as well as what is agreeable.

Upon man, with ample means and appliances, the lesson of this all-pervading instinct and wisdom, is absolutely wasted. Before our doors,

at our very thresholds, impurities of all kinds are heaped up, and decay, in uninterrupted alternation,—the solemn warning of those “smitten with fever,” perhaps death, is alike unheeded,—and as much lukewarmness and irresolution are exhibited as to these matters at this day as in the time of rush-carpeted floors and a common dunghill.

Incidental to the justice of these observations, is the operation of this negligence in those holes and corners into which labouring men are often necessitously driven; wretched undrained streets and courts, totally unprovided with many requisite accommodations, pestiferous abodes,—which, from their closeness and manifold nuisances, have been not incorrectly described as “fever factories,”—where cleansing and purifying from the refuse and offensive matter, ever collected near masses of human dwellings, is strangely overlooked and culpably neglected.

No practice in the lower classes of society is so demoralising to themselves, or more repugnant to the good feelings of all, as the use of privies in common; not only should there be separate accom

modation for each house, but it is highly desirable for the sexes also: promiscuous use not only destroys all refinement, but swamps the decency of human creatures. To many of the close courts and alleys around the Market, these remarks may be known by some as more immediately applicable. For the use of Castle-buildings there are eight privies for general resort, and for proper appropriation to tenants only; these were once all provided with locks and keys; but several of them are virtually useless, the keys having been lost by former tenants, and the landlord declining to supply others at his cost; many, who are unable or unwilling to provide them anew are, therefore, driven to practices alike repulsive to their own better dispositions, prejudicial to their health, and ruinous to the morals of their families.

Opinions, as before noticed, certainly have been at variance whether the accumulative presence of filth and pollution is of itself sufficiently potent to generate fever; but no difference or doubt whatever exists as to the fact, that exhalations from these do in no common degree favour the



extension and augment the danger, seldom stopping at a single case when once it has appeared; while, in more airy situations, and in dwellings of the wealthier classes, around which such impurities do not exist, fever, once introduced, is hardly ever known to spread. But independently of all their physical horrors, the neglect of these necessary accommodations for the poor is, at the same time, always found to be destructive of refinement and common delicacy. But sufficiently to appreciate the extent of this, as fitting to Birkenhead, would require personal investigation, and the actual inspection of scenes which otherwise would be almost doubted; the consequences arising from which would inspire the moralist with ample scope for his most energetic labours, believing, as has been forced upon me, that deep and lamentable must be the effects on those subjected to such influences.

I occasionally find in a dense neighbourhood some four or six privies, for the general use and convenience of the whole population of a crowded court, averaging possibly upwards of one hundred



souls, and these without doors, or any degree of privacy, and, as a consequence, odiously filthy, and eminently calculated in all respects to break down or blunt all sense of propriety, decency, or common cleanliness: their charge being the business of no one, they are left free from officious molestation; and any understood arrangements amongst the tenants, as to alternate care, gradually falls into desuetude, through the misconduct of some, and, in the end, it probably becomes a cause of recrimination and quarrelling. In Miller's-court also, for the use of the thickly-congregated inhabitants of sixteen houses, there are only four privies, openly exposed, the doors being destroyed, the seats and interiors are never cleaned, and the general appearance is most shockingly revolting. The inhabitants of these courts vehemently decry the system on many accounts, and attribute much of the sickness to the prevalent offensive atmosphere, and I believe them not to be mistaken.

In Meacock-street are some houses of a somewhat better kind than those in the adjacent streets, but without either midden or privy, the yards attached

are consequently in a state execrably disgusting to the senses; and the mother of a young family sensitively observed to me, that the “decent at all” are actually obliged to go almost into the country. The want of these leads also to the accumulation of all kinds of filth and garbage about their doors or the first convenient entry.

That there is any deficiency of proper feeling or desire, on the part of those unfortunately subject to these contaminations, it would be a slur on human nature even to insinuate; all whose opinions are canvassed, without exception, evince the liveliest concern in the inquiry, seem to feel degraded in their own estimation by tacit submission to such loathsome customs, and deplore the inevitable evil of such example on their children.

These recitals, I am aware, are extremely disgusting, nay humiliating, to well ordered minds, but as the conduct and condition of man is ever liable to the influence of all circumstances surrounding him, however trifling, with the Roman moralist as a precedent, that “Nothing relating to man is beneath man’s care,” I also, similarly

actuated, have learned for myself the truth of these abominations, and give publicity to their being, in the hope of arousing some amongst us, in possession of wealth, spirit, and influence, who will apply themselves to the eradication of this and any other proved vitiations, from a lasting growth in Birkenhead, and which I regret to perceive from indications now progressing, is much to be apprehended. I allude more particularly to a range of houses completing a close blocked up court or *cul-de-sac* in north Birkenhead, where a certain number of privies in the same objectionable manner are appropriated to the use of the general population in that property.

At Taylor's-buildings, Grange-lane, is also a contrivance which, though well intentioned as an experiment, is not I think found practically serviceable or deserving of imitation, except with some superior modifications; this is a general ash-pit at each end of a row of tenements, formed below the surface, and probably capacious enough for the expected uses, but they are all covered with a grid through which it was supposed the ashes would

pass, but as improvidence perhaps prevails hereabouts, and the coals are not reduced to ashes, these speedily become choked, and instead of sifting at the grid, and to save the journey there, convenient small ash-pits are sometimes found opposite each door.

The system also of cleansing these ash-pits, &c., is, I humbly submit, deserving of consideration with a view to amendment, as the intervals seem to me too long, and too dependent on some capricious events. At present, when the services of certain necessary officials are required, it is incumbent on the housekeeper to give previous information at the proper office at the Town Hall, but it frequently happens that this, from some unintentional reason, as forgetfulness or perhaps ignorance where to apprise the parties, is delayed from day to day till the nuisance has gained its height, and in the case of those common resorts before alluded to, they are abandoned to chance altogether, sometimes overflowing into the courts, and streaming into the adjoining houses. Indeed the two proximate tenements are necessitously exposed to the constant

witnessing and infliction of these grossest of nuisances, and the description of their sufferance varies but in degree; sickness and fever, with malarious symptoms, and prolonged confinement, are often represented to me as originating from this cause and no other.

I have reason to believe from my own observation of the inoperativeness of this regulation and its evil results, that it might possibly be more desirable to remove the necessitous application from the householder altogether, and to incorporate the daily or frequent inspection with a portion of the duty of the police, each in his district, or some other proper officer, who also should exact that it be properly as well as punctually done. Such details are of course offered merely as suggestions, my desire being to point out more particularly, in a medical point of view, the evils as they do exist, and the injurious effects likely to result from them.

If the system of preliminary notice, &c., be open to objection, and be found faulty in practice, that of the manner of cleansing these places must be



admittedly so. Without being an actual spectator, I can perceive that the "midden" is never thoroughly emptied, but a residue, and that the most pernicious portion, of liquid filth is invariably left behind; partly perhaps from the difficulty of carriage, or baling out, or more probably from the mode of payment to the men, being until recently at a certain rate per load; of course they were mainly anxious to make a "good night," and contented themselves with taking only the more solid mass of refuse, ashes, &c., &c., or, as it is professionally termed, "topping it," unwilling to be at the trouble of taking what was difficult to get up, and scarcely marketable when obtained. Indeed I learned from one of the craft, that if very liquid they sometimes would decline touching it at all.

As a "censor is nothing if not critical," I would also remark that the middens or ashpits are generally of too great a depth, and are considerably more capacious than is necessary or desirable, for, as they are never reported till actually full, they often contain the accumulations of every kind and degree of six or eight months, at all seasons of the

year, and from such masses of festering corruption, not few and far between, but thick and close, it is only a natural contingency that a feculent, poisonous atmosphere is engendered and constantly maintained, ever floating around us, tainting the whole locality, and spreading its noxious particles in every direction.

The only truly effective remedy, calculated to reach these circumstances will, I think, be by a complete separation of the double purpose of the present middens, appropriating a *covered* receptacle, as usual in London, &c., for ashes and house refuse, and confining the other to its particular intention only, and, with an *efficient* supply of water, to wash away the *soil* by drains of proper adaptation, with traps, &c., into the main sewer; for I have an impression that any attempt to furnish (at least in the present day) small houses and cottage tenements with regularly-constructed water-closets would not only impose a serious and unwarranted expense upon builders, and recoil on the tenantry in the form of increased rent, but which, I am persuaded, would be found futile in prac-



tice, through misapplication or careless management.

Some ingenious contrivances on the self-acting principle have been recommended, and freely adopted in London and elsewhere; indeed some are now in operation in cottages lately built here, and are found, I believe, fully to answer the purpose, being cleanly, productive of no smell, and not at all liable to get out of repair; but these are minutiae in a degree trenching upon my self-imposed limits, and more fit for the consideration of the landlord and the builder.

At all events, whatever plan may be adopted, undoubtedly some great change from the present system should be made. If the reader will take the trouble to glance at table No. 8, of the General Summary, I think he will be perfectly convinced of the truth of this. In Brook-street, as the table shows, there is one privy for 9 houses and 33 inhabitants; in Cloughton-cum-Grange, there is one privy for 6 houses and 34 inhabitants; in Grange-street, one privy for 3 houses and 20 inhabitants; in Meacock-street, one privy for 8 houses

and 61 inhabitants; besides many others, as the table shows, equally calling for reform. How can we look for either decency or morality amongst the labouring classes, whilst such evils are permitted to exist? Another branch of this part of my arrangement having occupied some considerable degree of attention, may now find appropriate mention here, I allude to the practicable establishment of public necessaries and the increased number of urinals. As I have no doubt proper consideration will in due time be given to this subject by the authorities, I prefer not enlarging on these topics, but would merely point out the necessity of them for the preservation of public health, as well as decency, as every medical man must be well aware of the injury arising to the animal functions from retention, caused by not having an unobserved opportunity of obeying the calls of nature. I will now proceed to make a few remarks on the cleansing of the surface of the streets, or scavenging.

I may observe that here, so far as my inquiry will support me, the streets are, where attempted,

generally cleaned in a sufficiently satisfactory manner; opinions may be entertained as to the preferable use of the machine in relation both to efficiency and expense, as compared with the ordinary method, but it is unnecessary for me to canvass or analyze their respective merits; nevertheless there are some streets, courts, and alleys where a trial of one or the other might be equally novel and useful. If it be true, as a resident in Albert-terrace told me, that she had never once seen a scavenger there in the day time, but had some slight recollection of a "muck thief," coming one night to an opposite stable, and further, apparently in a most satisfactory manner to herself, explained the omission, by supposing the scavengers might be deterred by the mass of dirt which had consequently accumulated.

In my walks through the township my attention has been repeatedly attracted to the want of some better arrangement for the removal of filth, &c., extracted from gully holes, which, contrary to all good judgment, is allowed to remain sometimes for three or four days, in short, until the street may

be visited by the cart; these heaps, meantime, being productive of very disagreeable smells, untidy in appearance, and liable either to be dispersed by passing vehicles, or again washed by rain into the sewers; indeed, where I have more particularly noticed this custom, (in Back Chester-street,) the main sewer when recently opened was found to be so choked up, that as a witness expressed himself, he could scarcely pass his hand into it. Some streets have been from some, I hope, explicable cause, neglected altogether, perhaps arising from the interregnum between the completion of the street by the landlord, and the assumption of power by the authorities; however this may be, the consequence is, that Austin-street has remained as left by the paviors, 12 months since, uninvaded by any broom or shovel during the whole period; the numerous occupants depositing all their ashes and filthy refuse before the doors with impunity, a portion is occasionally carried off by heavy rains, and the fortunate inclination of the ground, but enough still remains to excite the abhorrence of the more cleanly, and the alarm of the physician.

Another street (Back Oliver-street), I have remarked, as not paved at all, the whole extent a heterogenous mass of abominations: no cleansing or drainage, and further, aided by the tributaries of some stabling, and a quondam slaughter-house; the result of all this, it will scarcely be necessary to name, fever and sickness, as usual. One sufferer assured me that she could perceive the moment of being struck ill by inhaling or swallowing the foetid air, as standing at the door.

I do not mention these cases reproachfully, or in condemnation of any one, they are, I have no doubt, in some measure inseparable from the formation of a new town; I only, in a medical capacity, regret their existence, and offer my quota of experience to their consequential results.

### NEWLY-BUILT HOUSES.

These are another cause of illhealth to the lower classes in Birkenhead, from too hasty occupation. Probably but few persons are aware of, or would suspect the danger to health, indeed I may say life,

attending the occupation of houses recently built, and before the plastered walls are thoroughly and properly dried ; not uncommonly before the workmen have entirely quitted the building, tenants, inadvertently, or in ignorance, enter, and too soon discover the evil, but, from terms of agreement, are unable to leave for perhaps three or six months ; fires are lighted, which rather aggravate than relieve the nuisance, and the Medical attendant finds possibly the whole family suffering illness in some form or other ; colds, catarrhs, rheumatism, and other inflammatory diseases arising from damp, with peculiar affections of the throat and lungs, produced by breathing exhalations thrown out by the newly-plastered walls, are the never-failing results.

I have known even architects and builders themselves, so seldom are the noxious effects thought of by them, allow friends, and even near relations, to enter houses while “green,” despite of the expostulatory warnings even of the very workmen. Several cases of acute rheumatism and other inflammatory complaints have occurred



confirmatory of the mischief, in my own practice, and irresistibly press the absolute necessity of some supervising power by the surveyor or other officer to protect the unwary. In conversation with some of my medical brethren here, I find that many cases of illness arising from a similar cause have also come under their observation.

I give an excerpt from the "Health of Towns' Advocate," showing the peculiar manner in which people are affected who are exposed to breathe the exhalations from newly-plastered apartments :

" The action of this cause of disease is somewhat peculiar, for it appears that particles of lime are at times dissolved in the moisture, and cause death by irritating the throat and lungs. Gmelin (in his *Geschichte der Gifte*) has given the following illustrations of the fact:—' Three children lay for some nights in a room which had been plastered with fresh lime a short time previously. They were all seized with a disease of the throat, of which they died by suffocation in two days.' "

Another instance is cited, of two brothers having slept in a room which had never had a fire in it



till that night. They were both seized with headache and severe suffering, ending in vomiting and perspiration, which relieved the symptoms.

The "Health of Towns' Advocate" also relates another instructive case in Toxteth-park, where a family took possession of a new house, the plaster of which was hardly firm. "Two large fires were lit to dry the walls; and immediately thereafter the mother was seized with a severe inflammatory affection of the mouth, throat, and windpipe. The disease was quite peculiar in its character, and placed the patient in great danger for some time."

I know that a practice, mentioned also in the "Health of Towns' Advocate," exists in Birkenhead, of sending workmen to be first tenants of new houses, and that much injury to their health has taken place in consequence; under proper sanitary regulations, no such outrage would for one moment be tolerated.

It has occurred to me also, that some improved method is required in laying down the stone floors of kitchens and cottages; some of these remaining constantly damp under almost any circumstances,

making an uncomfortable house, and productive of serious and lasting results to the health of those who frequently are compelled to sleep in such places. I find the flags generally laid at once upon the clay soil, which is cold, and communicative of wet chill ; this might be remedied by a precautionary false floor, or preparation of a proper absorbent dry bed.

I hope I may be pardoned hinting that there is scarcely any purpose to which a few shillings could be applied in a way more conducive to the comfort and cleanliness of small tenements and their occupants, than the occasional distribution of whitewash and colouring for the walls and ceiling, either gratuitously, or at a bare remunerative charge ; rarely, or never have I found any inclination amongst the owners of cottage property, to expend anything in this most necessary ally of clean and healthy houses, tenants have occupied for years, and never received any assistance towards a cost, which is sometimes incurred at great inconvenience, and often for the same reason, or ignorance, how or where to procure the materials, is aban-

doned altogether, until the dingy black walls, strikingly offensive from dirt and vermin, wrest from an observer the conviction of some needful compulsion or assistance.

## LIGHT.

Every additional step taken in the progress of our enquiry into the predominance of particular diseases, occurring with unusual virulence and frequency in certain localities, and under special circumstances, tends not only to enlarge our own knowledge, but also to prove how singularly little has been hitherto gathered from what might be surmised, could scarcely escape daily observation. For instance, few, except those whose professional duties or interested pursuits, bring them acquainted with the reality, would in any adequate degree give credit to the vast importance and signal effect of solar light upon the human frame, and incidentally upon man's social habits.

The character and extent of its influence upon all vegetables, and its essential value to their due

growth and development, we all have at some time observed and familiarly acted upon, but without entertaining the further consideration, that, as a primary element, it is also universally and constantly affecting animated nature generally, in a direct and positive manner; in conjunction with this fact, it is curiously instructive to note, in the course of our experience of local sickness, that what frequently would seem the capricious freak of chance, or the effect of some subtle intangible agency, is, when examined more critically, discovered to arise from natural and explicable causes, and, that the ravages of some epidemic prevailing on one side of a street, or even building, without any prominent ostensible reason for the preference, are found upon closer scrutiny to have selected the shady or dark side only, for it is a well established truth, that not only does disease manifest more implacable features in such places, but that they are invariably less amenable to medical skill. Amongst the many affections discovered to exist in such unfavourable situations, scrofula is unquestionably rife; deformed and ricketty children abound; and

in short, the residents of narrow dark streets, may generally be selected from others by their sallow complexions, and general sickly appearance.

A child even does not require to be told that the plant he is rearing will not thrive in the dark, and the gardener, wishing to bleach one, secludes it from the light; it is not then necessary to bring forward any argument to enable us to come to the conclusion that the human frame is equally dependent on a sufficient supply of solar light for the development of the different parts of the body. It is evident that Providence has not given us so ample a supply of it for the purposes of vision only; but if the prejudicial effects of deficiency of light upon the functions and well-being of the human body are apparent, still more deplorable, if possible, are the consequences of its absence upon the mental and moral habits of those unhappily subjected to its deprivation. Darkness and evil have been so long and intimately associated as to be almost synonymous; and it will be by all readily conceded, that depraved and vicious classes are, unfailingly, the dwellers in close and

confined habitations ; even in purity itself, it produces a listless carelessness, and depression of spirits ; dirt and squalor follow, for a dark house is seldom or never a clean one ; and in proportion as man advances or retrogrades, so does the character of his impulses ;—thus habits are formed, and practices indulged in, which mutually and mischievously reacting each upon the other, in place of finding peace, contentment, and improvement in the dwellings of the working class, with ample supplies of fresh air, and the radiant light direct from Heaven, we have a wretched population, in the darkest hovels of the densest courts, surrounded by, and producing crimes and vices of every degree of vileness and degradation ; and all this not confined to our own times, but transmitted, in all its grossness, even to remote generations.

I am fully aware it is sufficiently easy to point out abuses, and vehemently to insist upon correction, and that this feeling is held in common with many others, who as ardently desire their extinction, but yield to the force of objections, that



such attempts are inexpedient, inasmuch as they go to recommend an arbitrary interference with private property, or the unnecessary expenditure of public money ; but, as my observations and strictures are rather intended as prospective warnings, and addressed not so much to actual cases, which in Birkenhead fortunately are comparatively rare, as to the obviation of such nuisances as are witnessed in Liverpool, and those of our ancient cities, where through want of some prohibitory power originally, the population has been compressed into a small compass, and space has now become proportionably valuable, and consequently remedies costly, or impossible.

I may be pardoned the dwelling upon with some earnestness, and urging, perhaps rather intensely, some impressions which may be open to exception, but I have always considered that what interferes with the public health, the public enjoyment, or the public interest, is at all times fair matter for disquisition, and can scarcely be called the inalienable property of any one, when good and sufficient cause can be shown for its removal or improvement.



In the suggestions of any amendments applicable to these cases, we are met by the same obstacles which have been alluded to as inimical to perfect ventilation, and which are equally frustrative of free and wholesome diffusion of light, further aided most potently by the operation of the window tax, which however defensible on fiscal grounds, as a source of revenue, (but which it would be irrelevant here to discuss,) is unquestionably found to be a predominant hindrance to that comfort and desirable construction in the lower class of dwellings, which ought to be the first consideration, and, with which no other reasons should compete; but in direct violation, we have in Birkenhead, for the paltry penny-wise saving of a few yards of land, narrow courts built and building, back to back—(I will not here particularize)—closed at the end by a wall or gable, nearly impervious to solar light or warmth, almost exclusive of the air itself, with apartments from the lower chinks or slits of which the sky is never visible. Now with these nooks and corners so malformed and densely peopled, can we continue to receive with

amazement the shocking recitals of other places, or hesitate to admit, that but for timely care and precaution, the same affliction is impending over ourselves? In Manchester, an example pregnant with a useful lesson on this want of foresight, is afforded by the annual appropriation of large sums, for the sole purpose of purchasing and levelling houses, or obstructions, when experienced to be productive of those social evils of which we now complain; proving how much better, more economical, and sagacious it will be, rather to discourage the existence than to wait for the evil, and then expend our wealth and energies in futile attempts at palliation.

## WATER.

Of the many beneficial results to be augured from agitation and extended enquiry on our sanitary condition, and the best reparable expedients, not the least will be the dissipation of some extremely erroneous notions which had obtained credence, and largely prevailed amongst us, relative

to the supply of water and its dispensation. Having themselves learned to look upon it almost as a luxury, many have hitherto held the supposition that a moderate quantity merely would suffice for the wants of the poor, and that if furnished with enough for the common purposes of cookery and washing, every useful object would be attained, and all beyond would only be redundant and waste: but it must be again and again urged, by all who desiderate the advance of our species, until such fallacies are dispelled, that these, though highly necessary, are not those services which would even demand the greatest quantity; on the contrary, these require the smaller consumption, and, for the actual preservation of health, may almost be termed secondary. A full, constant, and unlimited fund must be ever at hand, a ready agent towards other domestic exigencies of cleanliness, and its consort, good health; and without which ample, nay extravagant supply, all attempts at sanatory improvement will be found abortive, and the very means intended as remedies, will become new and heightened sources of disease.

A laudable arrangement for this continued supply has been made at some tenements called Taylor's-buildings, by the construction of tanks, or reservoirs, on the roofs; but water exposed to atmospheric influences, and the collection of aerial impurities, is decidedly unfit for the purposes of food, and is by no means desirable as a substitute for that fresh, flowing stream, which remains yet to be insisted upon.

Before proceeding to any further consideration of this all-important subject, I may state that the quality of the water with which Birkenhead is supplied is undoubtedly excellent, and applicable both to domestic and manufacturing purposes. I give the analysis as ascertained by Dr. Playfair:—

One gallon contains 8,565 grains of solid matter, consisting as follows, viz:—

Carbonate of Lime .....	1.975
„ of Magnesia ....	0.700
Chloride of Calcium .....	0.635
„ of Magnesium .....	1.905
„ of Sodium .....	2.200
„ of Potassium .....	1.150

Total..... 8.565

Hardness, by Dr. Clark's test, 5°.

being about 9 deg. less of hardness than the water at Manchester.

That the quality of an article, entering so universally into the daily requirements of all, is a matter of some consequence, is not so likely to meet with a hesitating acquiescence, as the necessity of abundance,—but, probably, few in comparison are so informed of its potent and direct effect upon diet and health, as is actually in practice found to be the case,—an irresistible evidence of how essentially important is its possession, not only in superfluity, but also that it should be perfectly innocuous; yet so ignorant, reckless, or seared by habit to the usage of pollution itself, are many in this town, that I have met with numerous cases of virulent sickness, surely deducible from inattention to the quantity and quality of the water used.

In a court in Back Chester-street is a pump, supplying not only the inhabitants intended, but also contributing to the wants of others in the vicinity, who have no source of their own; the well of this pump is immediately adjoining and below the level of a privy attached to a Public House; the water obtained is therefore not only got with difficulty, but is so charged with filthy impurities, as

literally to stink, turns white when boiled, and, if kept in the house all night, becomes insufferably offensive and useless. Here, and in a parallel case near Brook-street, there is a common pump for the supply of about forty houses, which is not only insufficient, but subject to infiltrations from surrounding middens and privies, &c., which have been known to overflow, and run down the well in a quantity, obliging the residents either to procure from the stagnant pits, (which certainly abound here,) or to purchase from a neighbouring brew-house. Also near Watson-street are 12 or 14 houses supplied with water from a pump in a yard where the drainage is very defective, and subject to the same nuisances; this water is described as loathsome, and in summer will not keep sweet for two hours, but in cooking and other uses is so disguised and sophisticated, that I met with some who had never observed anything unusual or objectionable. Amongst these was a family, where the whole of them had been suffering from Fever and illness throughout the past summer, but unable to attribute it to any particular cause,—although I



consider, that from the circumstances, very little doubt can exist on the subject.

Sickness and fever throughout these localities are habitually present. The system of recourse to a common pump is radically objectionable, as now placed, amidst receptacles of all kinds of refuse, filth, and foul drains; using water from it is not only liable to disorder the healthy functions, but the supply itself from such a source is precarious. Two streets, Brook Street and Wood Street, depending upon one pump, any unusual demand exhausts the spring; through impatience the pump is deranged, and days of serious inconvenience supervene, attended too with the expense of repairs to be mutually borne by all. The labour and hindrance of time, are also inseparable charges, inducing a disinclination or indifference about the cleanliness of person or dwelling, and generally undermining any prepossessions of its value; for it is worthy of remark, how soon the best habits are overcome by example, and become extinguished by contact with slatterns and idlers.

One agent, operating very materially against



the abundance of water in the cottages of the poor, is the obligation of payment for the necessary pipes, &c., of introduction, this, neglected by the landlord, the tenants are unable to pay, and, consequently, remain without, although anxiously desirous to possess it, even, as one emphatically said, should they be obliged to stint themselves in food to meet the quarterly rate; and although the present proprietors, with commendable liberality, have in some suitable localities, at their own charge, brought the service pipe into the house, it is frequently in such situations as to be next to, if not entirely useless: I see it behind the front doors, in nearly inaccessible corners; and in one instance, in St. Anne-street, I observed it under a bed. No blame whatever is to be imputed to the Company, who do this of their own will, and manifest at all times, an extreme readiness to meet the accommodation of the poorer classes and their means; but on the other hand, seeing the generous spirit in which landlords would probably be met, it should be made incumbent upon all to place water in the most desirable situation, and within the reach of

every tenant: however they might at first disrelish to sanafy their property, I believe that real opposition would rapidly disappear before its improved salubrity, and relieved from the inflictions of squalor and sickness, landlords would find a more respectable, better rent-paying tenantry.

And equally subject to check and superintendence should be the price paid for it, which in many instances, indeed almost invariably, to the tenants of cottage property is above, nay double that actually required by the office, thus retailing at a profit an essence of life itself, and which they should rather be instrumental in giving; this, hard as it is upon those whose earnings are reckoned by pence, is yet cheerfully borne for the comfort's sake. And in all my enquiries, apart from the injustice of the addition, I have never heard any objection to payment, but rather expressions of deep satisfaction and assurance that they obtained their money's worth; and all observations in other places satisfy me, that no offering would be more highly prized by the poor than an all-sufficient supply, nor any necessary for which

they would more cheerfully pay a fair and adequate price.

There are minor exceptions which might be taken, but are perhaps inseparable from some necessitous connection with new pipes, or interference of some kind with the mains. That of which I hear most complaint, is the absence of water two whole days in the week; of itself an evil, affecting also its purity. The pipes being alternately charged and emptied, a slight degree of corrosion occurs, and the supply subsequent to an off-day is usually discoloured by the oxide of iron, which had accumulated in the interim. I have met with many objections to this presence of the rust, and have been at some pains to disabuse the minds of those who believe it to be materially noxious; this circumstance, sometimes leading to disinclination of use, would not happen with a high pressure, and is one of the many reasons to be urged for its adoption.

Further: it is found inconvenient, by one of the off-days being fixed for Tuesday, which, occurring early in the week, interferes with, and defers the

family washing, a point which most good housewives seem anxious, for several reasons, to avoid. Also, the water saved for use on these days being usually kept in open vessels, of themselves occupying much room, and causing inconvenience in a small apartment, soon become heated, and unfit for culinary purposes; and if the precaution has been by any chance neglected, constraining the use of rain water, which being collected in open tubs or crocks, seldom or never cleaned out, is but another term for soot and other kindred matters, floating in solution, and even when appropriated to the storing of pipe water only, such articles are occasionally used as testify rather the ingenuity of their application, than exact our respect for their taste; old butts, rum puncheons, and even tallow casks, often of decayed wood, have been known to be pressed into service, which, subject to the accumulation of various kinds of dirt, macerated and mixed up by every fresh supply, does duty till the offence reaches its climax.

In those tanks or cisterns, in use also in our better class of houses, not excepting Hamilton

Square, and some other places of great pretensions, I detect the same oversight or inattention; here, generally as matter of economical arrangement, they are placed as nearly as may be above the water closet, still uncovered, or at least not air-tight, and receptive of all the foetid gas invariably present, and other casual impurities wafted by every current, and which I am thoroughly convinced do often instil peculiarity of flavour and other disgusting qualities not so easily distinguishable or recognised: of this liability to accidental impurities, a case has come to my knowledge, where for a considerable length of time great annoyance was experienced by a family from the unpleasant odour and repulsive taste, affecting the water used for domestic purposes, which water was supplied from an open cistern; every probable cause was sought for, and a variety of explanations suggested, until at much inconvenience the tank itself was taken down, being so situated as to preclude the examination, and in it were found the remains of a decomposed rat, which had accidentally fallen in: this may be an uncommon



occurrence, but of the daily possibility of such, and the actual existence of like nuisances, no more doubt can be entertained, than of the unwholesome deleterious effects when detected.

The saving of charge also upon the house-owner, ultimately exacted from the tenant in the shape of rent, between those cisterns and the pipe only necessary for the service of continued supply, would, I have learned, be well deserving consideration, amounting I am informed to upwards of £2 each. The use of ball-cocks as a part of the contrivance is also decidedly objectionable; they frequently become fixed, refuse to act, and not only is there often an unnecessary waste of water, but from flooding into the house, or shop, great inconvenience, and occasionally a vast destruction of property. I know of a case where a great loss was sustained in one night from this cause, destroying a quantity of valuable books, prints, furniture, &c. All these instances seem to me conclusive of the disadvantages of the present system, and incontestably to prove, that public interest and private welfare require an abandonment of the



intermittent plan of supply, and the adoption of constant service and high pressure.

It not unfrequently happens, in this town, that I find many poor people so situated as to be wholly destitute of water of any description, and in reply to the question, how they manage to procure it, the answer given is, "We steal it." I was lately told by a poor woman so circumstanced, with a large family living in Connor's-court, Back Chester-street, where a pump is derisively placed, as it were, but which has not furnished water of any kind for many years, that fearful lest her children might insensibly acquire a laxity as to the ownership of property, she invariably at night-fall, or some other convenient period, goes herself in search of water, but with feelings, to use her own expression, as if she were prowling for plunder; and often has she forgone her own tea that the paltry modicum obtained, might be divided amongst her children.

By referring to the following Table, it will be seen that there are 387 houses, with 2437 inhabitants, totally without any supply of water. In .

Neptune-street there is one pump to 24 houses and 200 inhabitants; Wood-street, one pump to 19 houses and 116 inhabitants; and Back St. Anne-street, one pump to 11 houses and 170 inhabitants; beside many others equally badly off.

TABLE,

Showing the number of Houses in BIRKENHEAD with open Cess-pools, also the number of Houses supplied with Water, how they are supplied, &c.

	No. of houses with open Cess-pools.	No of houses having dust-bins separate from privies.	No. of houses having pigsties and pigs.		No. of houses supplied with water from the public Waterworks.	Inhabitants,	No. of houses with Cisterns.	No. of houses supplied with Pumps.	Inhabitants.	No. of houses without Water.	Inhabitants.
Streets	2154	84	130	195	1563	10867	307	445	3026	330	2085
Courts.	251	47	15	15	291	1754	55	13	61	57	352

Independently of the gradual extinction of right and honest principles, in such a case as this, let us glance at the social effect of this primary want on the comfort of a family,—the exhausted husband returning from labour to a dirty and cheerless fireside, is unavoidably forced to an unfavourable comparison with the bright, cleanly aspect of the tavern, or beer-shop, and led thus to dissipate his hard earnings, and perhaps allowing his mind to lose its balance in intoxication, he not only

the community, they will ever be acting as antagonistic to, and frustrative of, all the moral training of the teacher.

On reviewing seriatim the several purposes requiring a profusion of that which is now private property, and chargeable to the township at a profit, although allowedly small, it does seem likely to lead to a confliction of interests where the various requirements may be differently regarded, and sacrifices may sometimes be necessary towards assisting the efficiency of the whole scheme, and carrying out, "*in extenso*," the plans and designs of the executive ; for these reasons I conceive, that the whole of the apparatus for the distribution of water should form, in conjunction with the *drainage* and *sewerage*, a part and portion of one comprehensive machinery ; and that there should be but one governing body for all municipal purposes ; separate authorities leading to much practical inconvenience, and wanting that uniformity of action which can only be secured by combined management. But without any desire to enter into, in fact, rather eschewing the stormy field of

polemics, or staying to weigh the balance between these and the contra arguments of superior vigilance, enlarged energy, and more disinterested trust, I will at once discharge myself of any inclination, and quote the opinion of Mr. Robert Chambers of Edinburgh, a shrewd practical gentleman, whose views may be generally received with approval: he says “that the supply of water ought to be the duty of the state, or at least of the municipality of each town, to furnish this indispensable element of health on a large scale of gratuitous distribution, to the less opulent class,” &c., &c.

The Marquis of Normanby says—“no legislative enactment will, in practice, be found to be effectual, unless a distinct authority be appointed to superintend and enforce the execution: all witnesses affirm their full conviction, that this is of so much importance, that without it, there is risk of failure of the best devised measures.”

But however attained, or by whomsoever accomplished, sanatory improvements to be effectual, must be carried out on a large scale; there must

be no temporising expedients, but a high and persevering determination to effect all that is practicable. Hitherto, too little endeavour has been used to prevent the commission of evil by inducing principles and habits which overpower the tendency, although a field of beneficent labour, legitimately within the scope of the legislator and philanthropist, and affording a common ground for the exertions of all who take an interest in human happiness, and any measures calculated for its extension. As this is done, the progress of society is certain, for, as an individual is influenced by a feeling of sense of duty, and exactitude of conduct, he lives an appropriate life, he studies the interest of others, and considers their well-being as an object equally estimable with his own.

## LODGING HOUSES.

Among the numerous matters bearing upon this subject, and, for various reasons, requiring the cognizance of some local vigilant inspection and control, none are more deserving of our anxious consideration than the Lodging Houses frequented by the lower classes of the people; these are not only often ill adapted for the purpose, badly ventilated, damp, unwholesome, and unprovided with necessary furniture, bedding, &c., but are in general, fearfully overcrowded, and without that due separation of the sexes, and wanting other arrangements which decorum and decency require, destructive of all delicacy if not positive incentives to vice, and in cases of contagious diseases, from the migratory character of the inmates, these are not unfrequently contracted, and carried to remote and otherwise healthy districts.

A lengthened detail of the occurrences to be



daily witnessed in these places, would not only be shockingly offensive in recital to all sensitive minds, but as repetition of former statements, in some degree unnecessary, yet I may briefly state my knowledge of houses here not only where the small apartments are crammed, averaging 8 to 9 persons living in each throughout the day, but where in the cellars, (places, as residents in the house have told me, they would not put a dog in), shavings are thrown in a heap, to the depth of some feet, to keep their bodies off the wet floor, and upon these are promiscuously huddled, as many persons, male and female, as can possibly be accommodated, and to effect which they are obliged to be, alternately, with the head and feet in contrary directions. One of these cellars I could point out here, where, a few nights since, I know sixteen persons were, without distinction of sex, as above described, huddled together to pass the night on a bed of shavings.

From this fact, which is not isolated or rare, it must be sufficiently apparent to all, that without any inquisitorial interference with domestic

affairs, or infringement of that jealously guarded privilege, the liberty of the subject, some controlling check is highly necessary; for it is an incontrovertible bequest of experience, that those demoralizing scenes and practices annul all good principles, render the heart callous, and lead to the perpetual spread of wickedness, and corruption of the young,—who, in such sinks, instead of acquiring that truthfulness, honesty and virtue, by which they would render service in their generation, are imbibing all that is foul and loathsome, ruinous to them and their prosperity, and degrading to our nature as human beings.

### SLAUGHTER HOUSES.

However praiseworthy the intention, and desirable the establishment of these conveniences as originally planned, the object seems more than probable to be defeated, and its purpose, in a sanatory point of view somewhat to have failed—although 12 months since, isolated and on the

verge of the town, buildings have gradually advanced till they have arrived at the very entrance gates, and it is probable that a few years may witness the total hemming in of what should be far removed from dwellings.

Independently of situation, scarcely sufficient use seems to be made of the water so amply provided, and too much in respect to cleansing left to the slaughtermen, who, naturally consulting their own convenience, frequently content themselves with a shew of neatness, effected by a little saw-dust lightly thrown over, instead of a thorough and perfect sluicing, which is left to the resident superintendent to complete on a Saturday,—meantime the blood, garbage, and offal penetrate between the paving-stones, in some places small round pebbles, and must saturate the earth with a matter giving out offensive and disagreeable exhalations at favourable periods. The collection of filthy manure about the pigsties from which animal matter is not too sedulously separated, must also throw off a pestilential atmosphere, the effect of which may some day be witnessed in a

fearful shape, and when to this is added the aggregate of all the night-soil and street refuse collected by the scavengers, now amounting to many hundreds of tons, and the vicinage of the Gas Works, it is not surprising that it should be looked upon as the plague spot of the town.

The drainage also from the vast mass of villainous compounds is carried by open stream redolent of its treasures, along a district and past houses, the inhabitants of which have often and sorely complained.

#### OPIATES TO CHILDREN.

Of all the multiform assassinations of health and life, through ignorance and carelessness, none are more frightful in their nature from the helplessness of the victims, the insidious unsuspected character of the poison, and the distress of the almost heart-broken mother, the unintentional destroyer, than what is ominously yet expressively, termed "quietness" or opiates administered to

infants. Our newspapers almost daily teem with reiterated cases of the lamentable results, but no cautionary warning seems attended with any diminution of the horrible practice, which although it does not exactly murder the children in this way, not the less surely does it obstruct their health and growth, subject them to early disease, and send multitudes to an untimely grave.

The derangement of the digestive organs of infants, from the effects of breathing impure air, forces the mothers (in order to procure for them a few hours' repose,) to administer what is called soothing draughts, generally recommended by unlicensed practitioners, therefore uneducated men, whose only remedy when applied to in such cases is opium in some shape or other. The poor mothers from seeing what they fancy to be an improvement, (owing to the quietude produced) on the health of the child, continue not from bad motives, but through ignorance, to administer the narcotic, until the constitution of the child becomes completely undermined. I believe few can have an idea of the extent to which this practice

is carried even in Birkenhead. I have been called in many times by parents, when at last alarmed at the unnatural and lengthened sleep of their children, and the countenances of these poor infants soon betrayed to me the length of time they had been subject to the influence of the deleterious drug. These children invariably become emaciated, with sunken eyes, and pinched noses, and gradually assume the appearance of withered old age, but they rarely live beyond the the age of infancy, most generally dying of Convulsions, *Tabes Mesenterica*, or head affections.

It is truly amazing the quantity of opium a child can become accustomed to take, without inducing immediate bad effects; a very young child has been known to have had fifty drops of laudanum administered to it in one day. Mr. Brown the coroner of Nottingham states "that he knew one druggist who made up in one year 13cwt. of treacle into Godfrey's Cordial." Can no means therefore be taken to protect these valuable lives, to rescue from the tomb, these martyrs of infatuated ignorance?



I subjoin a table showing the deaths from Convulsions in five of the principal towns of England, to which I have added those of Birkenhead and Tranmere, and it appears that the deaths from that disease in Birkenhead exceed those in Birmingham, Leeds, and London, but are rather below Manchester and Liverpool.

PROPORTION OF DEATHS FROM THREE DISEASES  
TO THE WHOLE POPULATION ANNUALLY.

	Birmingham	Leeds	Metropolis	Manchester	Liverpool	Birkenhead	Tranmere
Fever	1 in 917...1	in 849...1	in 690...1	in 498...1	in 407...1	in 313 $\frac{3}{5}$ ...1	in 774 $\frac{1}{3}$
* Consumption	1 in 207...1	in 209...1	in 246...1	in 172...1	in 156...1	in 337 $\frac{3}{5}$ ...1	in 259
Convulsions	1 in 645...1	in 301...1	in 453...1	in 205...1	in 188...1	in 278 $\frac{2}{3}$ ...1	in 234 $\frac{2}{3}$

Infantile Mortality is the best test of the salubrity, or insalubrity of any district, children being always found to be more susceptible to atmospheric influences than adults; besides the rate of mortality amongst this class is the least affected by migration and immigration, and not at all affected, as the adult classes are, by the physical circumstances attendant on their occupations.†

\* The above table also shows that the average of deaths from consumption, in Birkenhead, is not particularly great; but by adding the deaths from pneumonia and bronchitis to that of consumption, the mortality from affections of the respiratory organs is high, being in proportion to deaths from all diseases 16 $\frac{1}{5}$  per cent., or one in every 175 $\frac{1}{2}$  of the total inhabitants.

† Sanatory Report of the Borough of Reading.

The following table shows the number of deaths, in the towns just mentioued, above 70 and under 5 years of age, and I think the infantile mortality of Birkenhead must be startling to every one. Out of 614 deaths in 1846, 370 are children under 5 years of age, or  $60\frac{1}{6}$  per cent; in Tranmere the deaths were 152, and the deaths of children under 5 years 91, making  $59\frac{7}{8}$  per cent. In Liverpool, as Dr. Duncan shows, the mortality of children under that age is only  $52\frac{4}{5}$  per cent. The other five towns are greatly under Liverpool, Birkenhead, and Tranmere.

TABLE SHOWING THE NUMBER OF DEATHS  
ABOVE 70, AND UNDER 5 YEARS OF AGE,  
TO EVERY 100 DEATHS IN THE  
FOLLOWING TOWNS.

TOWNS.	Number of Deaths to every 100 Deaths.	
	Above 70.	Below 5.
Metropolis .....	$11\frac{8}{10}$	$40\frac{4}{5}$
Birmingham .....	$8\frac{1}{10}$	$48\frac{1}{5}$
Leeds .....	$7\frac{9}{10}$	48
Manchester .....	6	51
Liverpool .....	$5\frac{2}{5}$	$52\frac{4}{5}$
Birkenhead .....	$3\frac{1}{3}$	$60\frac{1}{6}$
Tranmere .....	$6\frac{1}{7}$	$59\frac{7}{8}$

The births in Birkenhead for 1846 were 809, and the deaths of children under 1 year 217 (as the tables at the commencement show), making the deaths of infants, before the expiry of the first year  $26\frac{3}{4}$  per cent. The births in Tranmere same year were 229, and the deaths of children under 1 year 62, making the per centage for that town 27.

The above statements, I think, bear me out in my previous assertion that infantile mortality in Birkenhead is equal to, if not greater than, that of any other town in England.

### GRAVE YARDS,

Of the manifold frightful results already experienced, and the dangerous effects constantly to be apprehended from grave yards and interments in inhabited districts, such an irresistible body of evidence has been accumulated, as to bring the existence of such into the category of direct nuisances, and that, crowded and overflowing, many of them are rapidly becoming so many centres of pestilen-

tial atmosphere, and manufactories of malaria. That such observations will not apply in all their force to the burial grounds of Birkenhead at present, I am happy to testify, but evils of this kind are silent and gradual in their approaches, and so many interests become involved during their growth, such sympathy for the honourable feelings of the living, that more objection is encountered from these reasons, than from any real negation of the existence of, or necessity, for their correction.

There is, besides, a growing inclination amongst our countrymen, to select places of sepulture for their dead in more secluded and peaceful retreats than are offered in the common church-yard, too often desecrated by daily traffic, or rude and unseemly sports, lacerating all their reverential and cherished sentiments so naturally called up by the sight, or even the thought of the hallowed spot.

Such desirable resting places for "life's wearied pilgrims" are fully provided in the efficient and comprehensive arrangements of most of our Cemeteries, where, amidst a solemn scene, beautified with flowers and shrubs, affection may have the undis-

turbed indulgence of its tenderest associations, and acted upon by silent surrounding influences, prompt suggestions soothing to the mourner, and calculated to leave in his breast resignation and hope.

To return to the burial grounds of Birkenhead, I am rather confirmed in my anticipation of the probable continuance and ultimate mischief to be apprehended from this highly objectionable practice, by observance of the system of interment, and the plans of sepulture now existing here, which, as just noted, though not calling for any marked reprobation, should still be viewed as to future exigencies, and for one or two other reasons further amenable to stricture.

After the exposition in my preceding pages of the great and manifest evils to be dreaded from decomposition of all animal matter, it must be apparent, that after consignment of our dead to the earth, extreme care should be taken that no escape of deleterious gas evolved in the process, or any offence connected therewith should again reach its surface; but through insufficient drainage of the ground itself, I have known extremely bad,

if not positively serious consequences to arise from immediate contact with the foetid moisture which has percolated from grave to grave, rendering the sexton's task equally difficult and disagreeable, occasionally, from stench and quantity even impossible, until baled out, when it has been again left on the surface to return into the soil, or to taint the air by poisonous evaporation.

The plan of a common grave kept constantly open, though not without precedent in most populous towns, and which is probably found a considerable saving of time and labour, where so frequently required, is deserving of the gravest consideration, with a view to amendment. A new grave is excavated to a depth of about 12 feet when possible, or not obstructed by water, and this, calculated to hold about 6 coffins, is never permanently filled up until it has received the complement, but merely covered by a loose wooden lid. Now, as this time, regulated by the deaths, is always uncertain, it may so happen, that, such opening may be productive of instant malady to all within its range, indeed cases have



been by no means rare or unauthenticated, and invariably where only temporarily closed, such spots must be at all times emitting foul and palpable exhalations in every way offensive and injurious.

In confirmation of what I have stated I beg to give a quotation from Taylor's Medical Jurisprudence, page 628 and 629:—"About the latter part of the last century, from fifteen to twenty thousand bodies, in almost every stage of decomposition, were removed from the Cimetiere des Innocens, in Paris, and the accidents that occurred during the operation, which lasted ten months, were, comparatively speaking, few. The workmen acknowledged to Fourcroy, that it was only in removing the recently interred corpses, and those which were not far advanced in decomposition, that they incurred any danger. In these cases the abdomen appeared to be much distended with gaseous matter,—if ruptured, the rupture commonly took place about the navel, and there issued a sanious fetid liquid, accompanied by

the evolution of a mephitic vapour, probably a mixture of carbonic acid and sulphuretted hydrogen. Those who respired this vapour at the moment of its extrication fell instantly into a state of asphyxia and died; while others, who were at a distance, and who consequently respired it in a diluted state, were affected with nausea, vertigo, and syncope, lasting for some hours, and followed by weakness and trembling of the limbs. Several lives have been lost, of late years, from the crowded state of burial grounds in London. A deep grave is dug, and this is kept open to be filled with coffins until filled. Persons venturing into these graves are immediately suffocated. The earth in these localities is strongly impregnated with poisonous exhalations; and no excavation can be made without its becoming immediately converted into a well of carbonic acid!" (See Henke's *Zeitschrift*, 1840, ii. 446. *Ann. D'Hyd.* 1832, 216; 1840, 131; 1843, 28. 32.

I trust also that, difficult as it may be to bury political differences and religious distinctions,

still that some attempt may be made to make the grave, where all should sleep in peace, the sepulchre also of all worldly opinions; that, as citizens of one empire, members of the same family, no line of demarcation or exclusive spot for peculiar creeds may exist; but that as death sternly teaches equality, and levels all asperities, there may be no sanction of any religious test for the grave,—no enquiry at the gate, but the whole open to the means or circumstances of all.

## THE PARK.

On arriving at this advanced portion of my observations, it is cheering to approach such an object of almost unqualified approval, and to contemplate for a moment another evidence of the energy, prescient care, and almost paternal consideration, indicated in the convenient and beautiful Park, (ground converted from a pestilent morass to ornamental pleasure grounds) for ever secured to the free use and resort of the

population of Birkenhead, and which, however calculated to extend the enjoyment and promote the health of our people, will also be found equally estimable for its social effects, and the enlargement of that sympathetic union which should universally pervade a great commercial family. There also exists in this case, scope and matter for a self-gratulatory and independent feeling in the mind of the resident, who, while appreciating its advantages, is also conscious that he holds the privilege as no chary favour or deputed permission, but in virtue of a right, to be freely transmitted to his successors, subject only to the necessary and comparatively trifling expense of its culture and supervision; for I find on reference to proper documents, that the whole of the internal portion laid out in carriage drives, walks, lakes, and ornamental grounds, dedicated in perpetuity for the recreation of the public, exclusive of seventy-one acres about the verge, reserved for the erection of suitable villas, comprises the vast area of one hundred and thirteen acres, and as a further proof of its more immediate economical

practicability, and as an encouragement to other places, I may mention that the eventual outlay will be such as to warrant and incite similar formations. The total cost of the land, with the unavoidable expenses of laying out, planting, and suitable lodges, being £127,775 17s. 6d., which has been met by the building land alluded to, and which, already partially sold, is computed at a liberal valuation to be worth £126,173 10s. 6d., leaving the actual cost of this splendid memorial of zeal and talent, at a sum of about £1,600 only.

As the influence of example, to be witnessed in the manners and bearing of the better educated, places of public resort, materially modifies and improves the conduct and habits of inferiors, and through them, for the effect is sympathetic, gives a tone to society at large. I hope to be pardoned suggesting, as a further object of attraction in the Park, and an intellectual recreation to those who can seldom attain such, but above all as a counterbalance to various seductions in the gross and demoralizing atmosphere of the beer-shop,

whether some occasional musical performance might not be advantageously and unobjectionably employed during the summer months; the charms of this science having ever been found as tending to purify the taste, and enlarge the enjoyments of all classes.

Having far exceeded the limits originally proposed in my consideration of this subject, I have been throughout the preceding pages reluctantly compelled materially to condense my remarks, and to omit altogether many very interesting statements; but I think that sufficient instances have been adduced to indicate the presence of circumstances, requiring our serious and combined exertions to counteract, by the substitution of superior and more happy arrangements.







## NOTE.

A very striking case, corroborative of my statement as to the urgent necessity that exists of having a place in Birkenhead for the reception of fever patients, occurred in my practice within the last few days.

I was requested to visit a poor family in Windsor-place, Chester-street, all of whom, it was stated were very ill. On my reaching the house, I found, to my amazement, the father, mother, and three children, all lying in the same small room, ill with fever, without a human being, either to attend on them, or to receive instructions as to their treatment. I begged some of the neighbours to assist them; but the reply was, "They had families of their own, and it could not be expected that they were to run the risk of attending such cases."

Yesterday morning, (14th March,) I was called up at six o'clock, by a person who requested me to hurry to the family above-mentioned, as the father was delirious. I immediately proceeded to the house, and found him perfectly outrageous, and that he had beaten, and turned out naked into the street, his wife and three daughters, all of whom, as before stated, were in the height of a fever. He had taken possession of the house, and it was not until the assistance of the police was obtained, that he was secured. Is it, therefore, to be wondered at, that fever should be so prevalent and fatal as it is in Birkenhead, when in such cases as the above there is not a single place provided for their reception?

As I previously stated, there is a dispensary and hospital here, but it is, as every one knows, principally appropriated to surgical cases, and has no ward allotted to those of fever. Small as the scale is on which this hospital is framed, it is found almost impossible to raise the necessary funds for its support; and it never will be otherwise, so long as it depends upon gratuitous

subscriptions, subject to the whim and caprice of every subscriber. Birkenhead is now entitled to a very different establishment, provided with both medical and surgical wards, and this, I am confident, can only be procured by levying a tax on the householders—say at the rate of one penny per pound; by so doing, more than a sufficient sum would be annually raised to support an infirmary on a larger scale, admitting every description of cases. This would doubtless be the means of preventing the mortality of Birkenhead from increasing, as it has done, for the last few years, and would be an incalculable blessing to all classes.





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T A B L E S

RELATING TO THE SUPPLY OF WATER

IN BIRKENHEAD,

&c. &c.

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# GENERAL SUMMARY.

## T A B L E S

### RELATING TO THE SUPPLY OF WATER IN BIRKENHEAD.

*The following Tables, relating to the supply of Water from the Public Works are correct, with the exception of Table No. 4, where the number of Houses are stated as being 1854, which Mr. HIGHFIELD, Manager of the Water Works, kindly informed me, ought to be 2000.*

(TABLE No. 1.)

#### NUMBER OF HOUSES, STREETS, AND COURTS.

	No. of Houses Occupied.	No. of Houses Unoccupied.	No. of Houses Unfinished.	Total No. of Inhabitants.	Total No. of Houses.
In Streets.....	2,341	859	394	15,978	3,594
In Courts.....	361	34	50	2,167	445
Total.....	2,702	893	444	18,145†	4,039

#### CLASSIFICATION OF HOUSES.

	Shops.	Public Houses.	Beer Houses.	Dwelling Houses
Streets ...	418	46	91	3039
Courts.....	...	..	..	445

† Table No. 1 of the General Summary shows the total number of inhabitants in Birkenhead for 1846 to be 18,145, being 65 less than stated in my Table at page 19, the amount there being 18,210; I have, however, adhered to the latter in my calculations of the mortality, believing it to approximate nearer the truth.

(TABLE No. 2.)  
RENTALS OF OCCUPIED HOUSES.

Rental £	5 to 10	10 to 15	15 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 to 110	110 to 120	120 to 130	130 to 140	140 to 150	150 to 160	160 to 200	200 to 300	300 to 350	350 to Total Houses
In Streets.	92	412	463	528	318	166	129	75	29	43	19	35	4	7	5	4	4	1	5	2	1
In Courts.	130	185	32	14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	222	597	495	542	318	166	129	75	29	43	19	35	4	7	5	4	4	1	5	2	1

(TABLE No. 3.)  
RENTALS OF UNOCCUPIED HOUSES.

Rental £ From	5 to 10	10 to 15	15 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 to 110	110 to 120	120 to 130	Total Houses
In Streets.	5	418	46	149	107	62	33	17	6	2	4	7	1	2	859
In Courts.	19	11	3	1	..	..	..	..	..	..	..	..	..	..	34
Total.	24	429	49	150	107	62	33	17	6	2	4	7	1	2	893

(TABLE No. 4.)

NUMBER OF HOUSES AND INHABITANTS THAT ARE SUPPLIED WITH WATER  
FROM THE PUBLIC WORKS.

Rental £	10 to 15		15 to 20		20 to 30		30 to 40		40 to 50		50 to 60		60 to 70		70 to 80		80 to 90		90 to 100		100 to 110		110 to 120		120 to 130		130 to 150		150 to 160		160 to 200		200 to 300		Total Houses.	Total Inhabitants.			
	10	15	15	20	20	30	30	40	40	50	50	60	60	70	70	80	80	90	90	100	100	110	110	120	120	130	130	150	150	160	160	200	200	300			300		
From																																							
In Streets.	30	297	333	341	211	112	76	48	21	35	10	26	3	7	4	1	3	1																			1563	10,867	
In Courts.																																						291	1,754
Total	122	451	364	355	211	112	76	48	21	35	10	26	3	7	4	1	3	1																			1854	12,621	



(TABLE No. 5.)

NUMBER OF INHABITANTS AND HOUSES THAT ARE SUPPLIED  
WITH WATER FROM PRIVATE PUMPS.

Rental £ From	5		10		15		20		30		40		50		60		70		80		90		100		110		130		200		300		350		Total Houses.	Total Inhabitants.
	to 10	15	to 15	20	to 20	30	to 30	40	to 40	50	to 50	60	to 60	70	to 70	80	to 80	90	to 90	100	to 100	110	to 110	130	to 130	200	to 200	300	to 300	350						
In Streets.	15	68		63	105	61		39		39		20		8		7		8		6		1		1		2		1		1		1	445	3,153		
In Courts.	7	6		..	..	..		..		..		..		..		..		..		..		..		..		..		..		..		13	61			
Total	22	74		63	105	61		39		39		20		8		7		8		6		1		1		2		1		1	458	3,087				

(TABLE No. 6.)  
 NUMBER OF INHABITANTS AND HOUSES WITHOUT ANY PROVISION  
 FOR WATER.

Rental £ From	5 to 10	10 to 15	15 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 80	80 to 90	90 to 100	Total Houses.	Total Inhabitants.
In Streets..	47	47	67	82	46	15	14	7	1	1	330	2,085
In Courts..	31	25	1	...	...	...	...	...	...	...	57	352
Total	78	72	68	82	46	15	14	7	1	1	387	2,437

NUMBER OF HOUSES AND THEIR INHABITANTS THAT ARE SUPPLIED WITH WATER FROM ONE TAP.  
 A STATEMENT OF THE NUMBER OF INHABITANTS AND THE NUMBER OF HOUSES IN STREETS AND COURTS THAT ARE SUPPLIED WITH WATER FROM ONE PUMP.

Streets and Courts.	No. of Houses.	No. of Inhabitants.	Names of Streets.	No. of Houses.	No. of Inhabitants.	Names of Courts.	No. of Houses.	No. of Inhabitants.
Grange Street ....	3	20	Bridge Street.....	2	11			
Do. do. ....	2	10	Brook Street.....	2	15			With one Pump for the supply of
John Street .....	6	21	Do. do. ....	12	78			
			Do. do. ....	5	27	In Brassey's Court.....	3	12
Courts.			Do. do. ....	3	20	„ Walter's Court .....	6	19
Coalbrook Cottages	4	25	Back St. Anne St...	11	170			
Evan's Court ....	7	39	George Street ....	7	41			
Miller's Court ....	16	92	Neptune Street.....	24	200			
Rushion's Court ...	6	22	Russell Street .....	2	10			
Tory Place .....	6	29	Do. do. ....	3	18			
			Do. do. ....	5	19			
			Wood Street.....	13	66			
			Do. do. ....	3	24			
			Do. do. ....	19	116			
			Do. do. ....	13	71			
			Do. do. ....	3	16			

(TABLE No. 8.)

A STATEMENT OF THE NUMBER OF PRIVIES THAT ARE USED BY THE INMATES OF MORE HOUSES THAN ONE,  
ALSO THE NUMBER OF HOUSES AND THE NUMBER OF INHABITANTS

Names of Streets.	No. of Privies.	No. of Houses.	No. of Inhabitants.
In Brook Street .....	there is 1	to 9	with 33
" Church Street .....	" 4	" 9	" 57
" Ditto do.....	" 2	" 7	" 35
" Grange Street .....	" 1	" 2	" 8
" Ditto do. ....	" 1	" 3	" 20
" Ditto do. ....	" 1	" 2	" 10
" John Street .....	" 1	" 6	" 21
" Meacock Street .....	" 1	" 8	" 61
" Waterloo Place .....	" 1	" 2	" 5
" Ditto do. ....	" 1	" 2	" 13
" Cloughton-cum-Grange "	" 1	" 6	" 34
In Albert Terrace.....	there are 4	to 7	with 51
" Ditto do. ....	" 4	" 7	" 50
" Albion do. ....	" 3	" 8	" 45
" Blandell's Court... ..	" 1	" 4	" 13
" Coalbrook Cottages ....	" 2	" 5	" 25
" Coleman's Court .....	" 2	" 12	" 44
" Chester Place.....	" 4	" 11	" 59
" Castle Buildings.....	" 9	" 16	" 109
" Evans' Court.....	" 4	" 7	" 39
" Leicester Terrace. ....	" 2	" 5	" 24
" Matthew's Court .....	" 13	" 19	" 74
" Mason's Court .....	" 1	" 6	" 30
" Miller's Court .....	" 4	" 16	" 92
" Orderly Avenue .....	" 10	" 12	" 50
" Orderly Residence .....	" 8	" 12	" 58
" Povall's Court .....	" 1	" 2	" 8
" Ditto do. ....	" 1	" 4	" 20
" Rush-ton's Court.....	" 2	" 6	" 22
" Swan's Court.....	" 1	" 2	" 3
" Scott's Court.....	" 1	" 2	" 7
" Tory Place .....	" 2	" 6	" 29
" Walter's Court .....	" 3	" 6	" 19
" Waterloo Buildings.....	" 1	" 2	" 13
" Ward's Place. ....	" 4	" 8	" 34
" Windsor Place.....	" 4	" 8	" 51
" Wilbraham Terrace.....	" 8	" 13	" 109
" William's Cottages .....	" 2	" 6	" 42

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